BILL

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

[RTID 0648- XB709]

Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to Ferry Berth Improvements in Tongass Narrows in Ketchikan, Alaska

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Notice; proposed incidental harassment authorization; request for comments on proposed authorization and possible Renewal.

SUMMARY: NMFS has received a request from the Alaska Department of Transportation and Public Facilities (ADOT) for an Incidental Harassment Authorization (IHA) to take marine mammals incidental to the construction of four ferry berth facilities in Tongass Narrows in Ketchikan, Alaska: the Gravina Airport Ferry Layup Facility, the Gravina Freight Facility, the Revilla New Ferry Berth, and the Gravina Island Shuttle Ferry Berth Facility. Pursuant to the Marine Mammal Protection Act (MMPA), NMFS is requesting comments on its proposal to issue an IHA to incidentally take marine mammals during the specified activities. NMFS is also requesting comments on a possible one-time, one-year renewal that could be issued under certain circumstances and if all requirements are met, as described in **Request for Public Comments** at the end of this notice. NMFS will consider public comments prior to making any final decision on the issuance of the requested MMPA authorizations and agency responses will be summarized in the final notice of our decision.

DATES: Comments and information must be received no later than [*INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER*].

ADDRESSES: Comments should be addressed to Jolie Harrison, Chief, Permits and Conservation Division, Office of Protected Resources, National Marine Fisheries Service. Written comments should be submitted via email to *ITP.Davis@noaa.gov*.

Instructions: NMFS is not responsible for comments sent by any other method, to any other address or individual, or received after the end of the comment period. Comments, including all attachments, must not exceed a 25-megabyte file size. All comments received are a part of the public record and will generally be posted online at *www.fisheries.noaa.gov/permit/incidental-take-authorizations-under-marine-mammal-protection-act* without change. All personal identifying information (*e.g.*, name, address) voluntarily submitted by the commenter may be publicly accessible. Do not submit confidential business information or otherwise sensitive or protected information.

FOR FURTHER INFORMATION CONTACT: Leah Davis, Office of Protected Resources, NMFS, (301) 427-8401. Electronic copies of the application and supporting documents, as well as a list of the references cited in this document, may be obtained online at: *https://www.fisheries.noaa.gov/permit/incidental-take-authorizations-under-marine-mammal-protection-act*. In case of problems accessing these documents, please call the contact listed above.

SUPPLEMENTARY INFORMATION:

Background

The MMPA prohibits the "take" of marine mammals, with certain exceptions. sections 101(a)(5)(A) and (D) of the MMPA (16 U.S.C. 1361 *et seq*.) direct the Secretary of Commerce (as delegated to NMFS) to allow, upon request, the incidental, but not intentional, taking of small numbers of marine mammals by U.S. citizens who engage in a specified activity (other than commercial fishing) within a specified geographical region if certain findings are made and either regulations are issued or, if the taking is limited to harassment, a notice of a proposed incidental take authorization may be provided to the public for review.

Authorization for incidental takings shall be granted if NMFS finds that the taking will have a negligible impact on the species or stock(s) and will not have an unmitigable adverse impact on the availability of the species or stock(s) for taking for subsistence uses (where relevant). Further, NMFS must prescribe the permissible methods of taking and other "means of effecting the least practicable adverse impact" on the affected species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of the species or stocks for taking for certain subsistence uses (referred to in shorthand as "mitigation"); and requirements pertaining to the mitigation, monitoring and reporting of the takings are set forth. The definitions of all applicable MMPA statutory terms cited above are included in the relevant sections below.

National Environmental Policy Act

To comply with the National Environmental Policy Act of 1969 (NEPA; 42 U.S.C. 4321 *et seq*.) and NOAA Administrative Order (NAO) 216-6A, NMFS must review our proposed action (*i.e.*, the issuance of an IHA) with respect to potential impacts on the human environment.

This action is consistent with categories of activities identified in Categorical Exclusion B4 (IHAs with no anticipated serious injury or mortality) of the Companion Manual for NOAA Administrative Order 216-6A, which do not individually or cumulatively have the potential for significant impacts on the quality of the human environment and for which we have not identified any extraordinary circumstances that would preclude this categorical exclusion. Accordingly, NMFS has preliminarily determined that the issuance of the proposed IHA qualifies to be categorically excluded from further NEPA review.

We will review all comments submitted in response to this notice prior to concluding our NEPA process or making a final decision on the IHA request.

Summary of Request

On August 19, 2021, NMFS received a request from the ADOT for an IHA to take marine mammals incidental to the construction of two ferry berth facilities in Tongass Narrows in Ketchikan, Alaska: the Gravina Airport Ferry Layup Facility and the Gravina Freight Facility. On December 17, 2021 we received a revised request that included additional work components associated with the Revilla New Ferry Berth and Upland Improvements and the New Gravina Island Shuttle Ferry Berth and Related Terminal Improvements in the same region. The application was deemed adequate and complete on January 4, 2022. ADOT's request is for take of a small number of eight species of marine mammals, by Level B harassment and Level A harassment. Of those eight species, five (Steller sea lion (*Eumetopias jubatus*), harbor seal (*Phoca vitulina richardii*), harbor porpoise (*Phocoena phocoena*), Dall's porpoise (*Phocoenoides dalli*) and minke whale (*Balaenoptera acutorostrata*)) may also be taken by Level A harassment. Neither the ADOT nor NMFS expects serious injury or mortality to result from this activity and, therefore, an IHA is appropriate.

NMFS previously issued two consecutive IHAs and a Renewal IHA to ADOT for this work (85 FR 673, January 7, 2020; 86 FR 23938, May 05, 2021). ADOT complied with all the requirements (*e.g.*, mitigation, monitoring, and reporting) of the previous IHAs and information regarding their monitoring results may be found in the **Description of Marine Mammals in the Area of Specified Activities** and **Marine Mammal Occurrence and Take Calculation and Estimation** sections. An IHA for the first phase of construction of the Ketchikan-Gravina Access Project was issued to ADOT on December 20, 2019 (85 FR 673, January 7, 2020). Complete construction of two of those components, the Revilla New Ferry Berth and Upland Improvements and Gravina Island

Shuttle Ferry Berth Facility/Related Terminal Improvements, did not occur within the timeframe authorized by the Phase 1 IHA and will not be finished before the expiration of the subsequent one-year renewal (86 FR 23938, May 05, 2021). Therefore, ADOT is requesting a new IHA for incidental take associated with the continued marine construction of these facilities. This proposed IHA would be valid for one year.

Description of Proposed Activity

Overview

ADOT is making improvements to existing ferry berths and constructing new ferry berths on Gravina Island and Revillagigedo (Revilla) Island in Tongass Narrows, near Ketchikan in southeast Alaska (Figure 1). These ferry facilities provide the only public access between the city of Ketchikan, AK on Revilla Island, and the Ketchikan International Airport on Gravina Island (Figure 1). The project's proposed activities that have the potential to take marine mammals, by Level A harassment and Level B harassment, include vibratory and impact pile driving, down-the-hole (DTH) operations for pile installation (rock socketing of piles and tension anchors to secure piles), and vibratory pile removal. The marine construction associated with the proposed activities is planned to occur over 91 non-consecutive days over one year beginning March 2022.

Improvement and construction of facilities is important to provide reliable access to the airport and facilitate growth and development in the region. Some of the existing ferry facilities are aging and periodically out-of-service for repairs or maintenance, and this project would provide redundant ferry berths to increase reliability. Ketchikan is Alaska's fifth largest city, with a population of approximately 8,125 (DCCED 2017), and has numerous marine facilities including fishing infrastructure, cruise and ferry terminals, and shipyards.

Figure 1-- Tongass Narrows Project Area

Dates and Duration

In-water construction is scheduled to begin on March 1, 2022, upon expiration of the current Phase I IHA (86 FR 23938; May 5, 2021). ADOT anticipates that construction would occur during daylight hours only with in-water construction occurring 6 days per week. ADOT anticipates that the project would require approximately 91 days of pile installation and removal over the course of 7 or 8 months. Although it is anticipated that the project would be completed sooner, ADOT requests that the IHA be valid for a full year, from March 1, 2022 to February 28, 2023, to accommodate scheduling unknowns or delays.

ADOT plans to implement the Essential Fish Habitat (EFH) Conservation Recommendations developed by NMFS. No in-water work would occur between March 1 and June 15 for three project components: the Revilla New Ferry Berth and Upland Improvements, Gravina Airport Ferry Layup Facility, and Revilla Refurbish Existing Ferry Berth Facility.

Specific Geographic Region

The proposed construction project is located in Ketchikan, Alaska (Figure 1). Improvements to the Gravina Airport Ferry Layup Facility construction would occur in the same location as the existing layup dock facility. The new Gravina Freight Facility would be constructed in the same location as the existing barge offload facility. The New Gravina Island Shuttle Ferry Berth construction would occur slightly North of the Airport Ferry Layup Facility. Improvements and construction on Revilla Island would occur approximately 4 kilometers (km; 2.5 miles (mi)) north of downtown Ketchikan. The new Revilla Island Airport Shuttle Ferry Berth would be constructed immediately adjacent to the existing Revilla Island Ferry Berth.

Tongass Narrows is an approximately 13-mile-long, north-south-oriented marine channel situated between Revilla Island to the east and Gravina Island to the west. In the vicinity of the proposed project, Tongass Narrows is as little as 300 meters (m; 984 feet;

ft) wide. Tongass Narrows is generally characterized by strong tidal currents and by steep bedrock or coarse gravel-cobble-boulder shoreline. Lower intertidal and shallow subtidal areas are often sandy or mixed gravel, sand, and shell, with varied amounts of silt. At other areas, however, such as at rocky points and along the northwestern shore of Pennock Island (which is located in the south end of Tongass Narrows, between Gravina and Revilla Islands), bedrock slopes steeply to subtidal depths. Subtidal habitats are a mix of bedrock outcrops or ledges, boulder-cobble slopes, and, where lower slopes permit, sandy gravel bottoms, often mixed with significant amounts of shell debris, similar to intertidal habitats.

Several small natural coves and areas protected by constructed breakwaters provide wave and current protection for marine habitats with sand or gravel bottoms with some areas of eelgrass (*Zostera marina*) beds. Extensive areas of riprap bank protection and fill occur along the northeastern shoreline of the City of Ketchikan. Construction of numerous buildings and docks on pilings over the intertidal and shallow subtidal zone has significantly modified the shorelines in these areas. Shoreline protection activities have similarly modified approximately 1 mile of the shoreline of Gravina Island in the vicinity of the airport and airport ferry terminal.

Water depths reach approximately 49 m (160 ft) in the middle of the Tongass Narrows between the airport and town, but generally do not exceed 18 m (60 ft) where piles would be installed. The channel bottom slopes at about 2:1 (horizontal: vertical) from opposite shores. Geological conditions in the vicinity of the project were recently evaluated (CH2M 2018). The substrate consists of approximately 18 to 23 m (60 to 75 ft) of very loose to very dense granular deltaic or alluvial sand and gravel. At approximately 18 to 23 m (60 to 75 ft) below the mudline, the substrate transitions to phyllite bedrock (CH2M 2018). Pile installation would occur in waters ranging in depth from less than 1 m (3.3 ft) nearshore to approximately 20 m (66 ft), depending on the structure and location.

Ongoing vessel activities throughout Tongass Narrows, land-based industrial and commercial activities, and regular aircraft operations result in elevated in-air and underwater sound conditions in the project area that increase with proximity to the proposed project component sites. Sound levels likely vary seasonally, with elevated levels during summer when the tourism and fishing industries are at their peaks.

Detailed Description of Specific Activity

Planned construction includes the installation and continued construction of new ferry facilities and the renovation of existing structures. As stated above, the four proposed construction components include: the Gravina Airport Ferry Layup Facility, the Gravina Freight Facility, the Revilla New Ferry Berth and Upland Improvements, and the New Gravina Island Shuttle Ferry Berth and Related Terminal Improvements. ADOT anticipates that work may occur at multiple sites concurrently, and that two hammers or DTH equipment could be used concurrently (discussed further in the **Estimated Take** section).

Gravina Airport Ferry Layup Facility

The new ferry layup dock and transfer bridge would support layup and maintenance of the airport ferry system. The current layup dock at the Gravina Airport Ferry Layup Facility is in disrepair and needs to be replaced. ADOT would remove the existing 265-ft (80.1-m)-long floating dock, mooring structures, and transfer bridge and construct a new 250-ft by 85-ft (76.2 m by 25.9 m) concrete or steel floating dock in its place. The floating dock would be restrained by two side-restraint float dolphins and three corner/mid-restraint float dolphins. A new 20-ft by 140-ft (6.1 m by 42.6 m) steel transfer bridge would provide access to the floating dock. It would be necessary to remove, relocate, and replenish the existing rock slope, demolish the existing concrete abutment, and construct a new pile-supported bridge abutment. The Gravina Airport Ferry Layup Facility construction and Gravina Freight Facility construction is anticipated to require a total of 47 days of in-water pile installation and removal.

Gravina Freight Facility

The new Gravina Freight Facility, located approximately 100 m from the Gravina Airport Ferry Layup Facility (Figure 1), would be constructed in the same location as the existing barge offload facility. This facility would provide improved access to Gravina Island for highway loads that cannot be accommodated by the shuttle ferry. The existing ramp would be widened and re-graded both above and below the high tide line. A new concrete plank or asphalt pavement ramp would be constructed in its place. Five breasting dolphins and one mooring dolphin would be constructed to support barge docking and would include pedestrian walkways for access by personnel. In addition, two new pile-supported mooring structures would be constructed above the high tide line. As stated above, the Gravina Airport Ferry Layup Facility construction and Gravina Freight Facility construction is anticipated to require a total of 47 days of in-water pile installation and removal.

Revilla New Ferry Berth and Upland Improvements

The new Revilla Island airport shuttle ferry berth is the only project component that would occur on Revilla Island, and is currently under construction immediately adjacent to the existing Revilla Island Ferry Berth (Figure 1). The new ferry berth consists of a 7,400 square ft (ft^2; 687.4 m^2) pile-supported approach trestle at the shore side of the ferry terminal and a 1,500 ft^2 (139.4 m) pile-supported approach trestle extension located landside and north of the new approach trestle. A 25-ft by 142-ft (7.6 m by 43.2 m) steel transfer bridge with vehicle traffic lane and separated pedestrian walkway extends from the trestle to a new 2,200 ft^2 (204.3 m^2) steel float and apron. The steel float is supported by three guide pile dolphins. A bulkhead retaining wall is being constructed at the transition from uplands to the approach trestle. Two new stern berth dolphins with fixed hanging fenders and three new floating fender dolphins are being constructed to moor vessels. The new apron would be supported by three new guide pile dolphins. Water depths at the dolphins reach approximately 60 ft (18.2 m).

While construction on the Revilla New Ferry Berth is already underway, ADOT anticipates that it would not be complete before ADOT's current IHA (86 FR 23938; May 5, 2021) expires. Therefore, ADOT has requested take associated with the portion of the project that it anticipates may remain, which consists of installation of up to five tension anchors.

Upland improvements associated with the Revilla New Ferry Berth include reconstruction of terminal facilities, installation of utilities, and construction of improvements to existing staging/parking areas. Upland improvements are not anticipated to harass marine mammals, and therefore, are not discussed further in this document.

Gravina Island Shuttle Ferry Berth and Related Terminal Improvements

The new Gravina Island Airport Shuttle Ferry Berth is currently under construction (86 FR 23938; May 5, 2021) immediately adjacent to the existing Gravina Island Ferry Berth (Figure 1). The new facility consists of an approximately 7,000 ft^2 (650.3 m^2) pile-supported approach trestle at the shore side of the ferry terminal. A 25-ft by 142-ft (7.6 m by 43.2 m) steel transfer bridge with vehicle traffic lane and separated pedestrian walkway leads to a new 2,200 ft^2 (204.3 m^2) steel float and apron. The steel float is supported by three new guide pile dolphins. Ferry berthing is supported by two new stern berth dolphins and three new floating fender dolphins. To support the new facility, a new bulkhead retaining wall is being constructed between the existing ferry berth and the new approach trestle. A new fill slope measuring approximately 21,200 ft^2 (1969.5 m^2) is being constructed west of the approach trestle. Upland improvements include widening of the ferry approach road, retrofits to the existing pedestrian walkway, installation of utilities, and construction of a new employee access walkway. Due to unforeseen construction delays encountered during the Phase 1 IHA construction period, ADOT anticipates that construction on the Gravina Island Shuttle Ferry Berth would not be completed before the expiration of the current IHA (86 FR 23938; May 5, 2021). Therefore, ADOT has requested take associated with the portion of the project that it anticipates may remain, which consists of up to 35 piles (both plumb and battered), 17–21 rock sockets, 28 tension anchors, and up to 4 micropile anchors (Table 1).

Across the four project sites, three methods of pile installation are anticipated. These include vibratory and impact hammers, use of DTH systems to make holes for rock sockets and tension and micropile anchors at some locations (Figure 1-3 of ADOT's IHA Application). Installation of steel piles through the sediment layer would be accomplished using vibratory or impact methods. Depending on the location, the pile would be advanced to refusal at bedrock. Where sediments are deep and rock socketing or anchoring (described below) is not required, the final approximately 10 ft (3 m) of driving would be conducted using an impact hammer so that the structural capacity of the pile embedment can be verified or proofed. Proofing is expected to require approximately 50 strikes over 15 minutes. Where sediments are shallow, an impact hammer would be used to seat the piles into competent bedrock before a DTH system is used to create holes for the rock sockets and/or tension anchors. The pile installation methods used would depend on sediment depth and conditions at each pile location.

Rock sockets are holes made in the bedrock where overlying sediments are too shallow to adequately secure the bottom portion of a pile using other methods. Rock sockets are constructed utilizing a DTH device which uses both rotary and percussion-type drill action. These devices consist of a drill bit that drills through the bedrock using both rotary and pulse impact mechanisms. This breaks up the rock to allow removal of the fragments, creating a hole that allows for insertion of the pile. The socket holes are just large enough for the pile to fit down in to provide lateral strength for the pile. The pile is usually advanced at the same time that drilling occurs (the bit has a flexible tip that can be retracted and pulled back up through the center of a pile). Rock socket holes would be up to 15 ft (4.6 m) into the bedrock. Drill cuttings are expelled from the top of the pile using compressed air and/or other fluids. It is estimated that use of DTH for rock sockets into the bedrock would take approximately 4–8 hours per pile. Some piles would be seated in rock sockets as well as anchored with tension anchors.

Tension anchors are comprised of a threaded steel rod grouted into the bedrock strata at a specified depth below the pile tip. The rod is tested and anchored to the top of the pile to resist uplift forces in the associated structure. Tension anchors are installed within piles that are DTH drilled or hammered into the bedrock below the elevation of the pile tip, after the pile has been driven through the sediment layer to refusal. A 6- or 8-inch-diameter steel pipe casing is inserted inside the larger-diameter production pile. A DTH hammer and bit is inserted into the casing, and a 6- to 8-inch-diameter hole is made into bedrock. The typical depth of the hole varies, but 20–30 ft (6.1 – 9.1 m) is common to meet engineering needs. Rock fragments would be removed through the top of the casing with compressed air. A steel rebar rod is then grouted into the drilled hole and affixed to the top of the pile.

Micropiles have a casing diameter of approximately 3 to 10 in. A DTH hammer device is used to create a hole in a manner identical to the rock sockets as described above. The micropile casing is inserted to depth and a steel reinforcement bar is inserted in the casing, and then grout is pumped into the casing. The construction of the Gravina Island Shuttle Ferry Berth could potentially utilize up to four micropiles. Because both tension anchors and micropiles require drilling an 8-inch-diameter hole, they are discussed together throughout this document.

Vibratory methods would also be used to remove temporary steel pipe piles. These proposed activities and the noise they produce have the potential to take marine mammals, by Level A harassment and Level B harassment of marine mammals.

Each of the project components would include installation of steel pipe piles that are 20, 24, or 30 inches in diameter (Table 1). Temporary piles would be installed and removed with a vibratory hammer. Some permanent piles would be battered (*i.e.*, installed at an angle). Approximately 50 impact strikes would be required for proofing each permanent pile, requiring approximately 15 minutes of active impact hammering per pile.

The estimated average installation rate for the project is one to one and a half permanent or two temporary pipe piles per day (Table 1). On some days, more or fewer piles or partial piles may be installed. It would likely not be possible to install an individual permanent pile to refusal with a vibratory hammer, use DTH methods for the rock socket, impact proof, and install the tension anchor on the same day. The construction crew may use a single installation method for multiple piles on a single day or find other efficiencies to increase production; the anticipated ranges of possible values are provided in Table 1. The estimated removal rate for temporary piles is two steel pipe piles per day. On some days, more or fewer piles may be removed. It is estimated that the 40 temporary piles would be removed in 36 days.

In sum, approximately 91 days of pile installation and removal are anticipated (Table 1), and of the 102 piles which ADOT anticipates it will install, 40 of them will be installed and removed (for a total of 142 pile installations and removals).

Above-water work would consist of the installation of a concrete float, a transfer bridge and transition ramp, dock-mounted fenders, and utility lines. A utility and storage building would be constructed on top of the concrete float. No in-water noise is anticipated in association with above-water and upland construction activities, and no associated take of marine mammals is anticipated from the noise or visual disturbance. Therefore, above-water and upland construction activities are not discussed further in this document.

Table 1-- Pile Details for Each Project Component

Project Component / Pile Type	Number of Piles	Number of Rock Sockets	Number of Tension Anchors	Average Vibratory Duration Per Pile (minutes)	Average DTH Duration for Rock Sockets Per Pile (minutes)	Average DTH Duration for Rock Tension Anchors Per Pile (minutes)	Impact Strikes Per Pile	Estimated Total Number of Hours	Average Piles per Day (Range)	Days of Installation and Removal
Gravina Airport Ferry Layup Facility										
24” Pile Diameter	8 (8 temporary[a])	0	0	15	N/A	N/A	N/A	4	2 (2-4)	8
30” Pile Diameter	14 (6 battered)	8	12	15	360	120	50	81	1 (1-3)	14
Gravina Freight Facility										
20” Pile Diameter	6 (battered)	0	6	15	N/A	120	50	15	1 (1-3)	6
24” Pile Diameter	15 (12 temporary [a])	3	3	15	360	120	50	31.5	1.5 (1-4)	15
30” Pile Diameter	4 (2 battered)	2	4	15	360	120	50	22	1 (1-3)	4
Revilla New Ferry Berth and Upland Improvements										
20” Pile Diameter	8 (8 temporary [a])	0	0	15	N/A	N/A	N/A	2	2 (2-4)	4 (removal only)
24” Pile Diameter	N/A	N/A	5	N/A	N/A	120	N/A	10	1.5 (1-3)	4
New Gravina Island Shuttle Ferry Berth/Related Terminal Improvements										
20” Pile Diameter	12 (12 temporary [a])	0	0	15	N/A	N/A	N/A	6	2 (2-4)	12
24” Pile Diameter	35 (18 battered)	21[b]	28	30	120[c]	120	50	125	1.5 (1-3)	24
Total	102	34	58					296.5		91

[a] Temporary piles would be installed and removed; it is assumed that the average vibratory duration per pile for both installation and removal would be 15 minutes.

[b] Up to four rock sockets could instead be micropile anchors.

[c] This value is a contractor estimate of the time needed to drill the rock sockets and differs from other estimates since there are different contractors for different components of the project.

Proposed mitigation, monitoring, and reporting measures are described in detail later in this document (please see **Proposed Mitigation** and **Proposed Monitoring and Reporting**).

Description of Marine Mammals in the Area of Specified Activities

Sections 3 and 4 of the application summarize available information regarding status and trends, distribution and habitat preferences, and behavior and life history, of the potentially affected species. Additional information regarding population trends and threats may be found in NMFS's Stock Assessment Reports (SARs; *https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessments*) and more general information about these species (*e.g.*, physical and behavioral descriptions) may be found on NMFS's website (*https://www.fisheries.noaa.gov/find-species)*.

Table 2 lists all species or stocks for which take is expected and proposed to be authorized for this specified activity, and summarizes information related to the population or stock, including regulatory status under the MMPA and Endangered Species Act (ESA) and potential biological removal (PBR), where known. For taxonomy, we follow Committee on Taxonomy (2021). PBR is defined by the MMPA as the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population (as described in NMFS's SARs). While no mortality is anticipated or authorized here, PBR and annual serious injury and mortality from anthropogenic sources are included here as gross indicators of the status of the species and other threats.

Marine mammal abundance estimates presented in this document represent the total number of individuals that make up a given stock or the total number estimated within a particular study or survey area. NMFS's stock abundance estimates for most species represent the total estimate of individuals within the geographic area, if known, that comprises that stock. For some species, this geographic area may extend beyond U.S. waters. All managed stocks in this region are assessed in NMFS's U.S. Alaska SARs (*e.g.*, Muto *et al.* 2021). All values presented in Table 2 are the most recent available at the time of publication and are available in the draft 2021 SARs (Muto *et al.* 2021; available online at: *https://www.fisheries.noaa.gov/national/marine-mammal-protection/draft-marine-mammal-stock-assessment-reports*).

Table 2—Marine Mammal Species or Stocks for Which Take is Expected and Proposed to be Authorized

Common name	Scientific name	MMPA Stock	ESA/MMPA status; Strategic (Y/N)[1]	Stock abundance Nbest, (CV; N_{min}; most recent abundance survey)[2]	PBR	Annual M/SI[3]
Order Cetartiodactyla – Cetacea – Superfamily Mysticeti (baleen whales)						
Family Balaenidae						
Humpback whale	*Megaptera novaeangliae*	Central North Pacific	E, D,Y	10,103 (0.3; 7,890; 2006)	83	26
Minke whale	*Balaenoptera acutorostrata*	Alaska	-, N	N.A.(See SAR; N.A.; see SAR)	UND	0
Order Cetartiodactyla – Cetacea – Superfamily Odontoceti (toothed whales, dolphins, and porpoises)						
Family Delphinidae						
Killer whale	*Orcinus orca*	Alaska Resident	-, N	2,347 (N.A.; 2,347; 2012)	24	1
		West Coast Transient	-, N	349 (N.A, 349; 2018)	3.5	0.4
		Northern Resident	-, N	302 (N.A.; 302; 2018	2.2	0.2
Pacific white-sided dolphin	*Lagenorhynchus obliquidens*	North Pacific	-,-; N	26,880 (N.A.; N.A.; 1990)	UND	0
Family Phocoenidae						
Harbor porpoise	*Phocoena phocoena*	Southeast Alaska	-, Y	See SAR (see SAR; see SAR; 2012)	See SAR	34

Dall's porpoise	*Phocoenoides dalli*	Alaska	-, N	See SAR (see SAR; see SAR; 2015)	See SAR	37
Order Carnivora – Superfamily Pinnipedia						
Family Otariidae (eared seals and sea lions)						
Steller sea lion	*Eumetopias jubatus*	Eastern U.S.	-,-, N	43,201 (see SAR; 43,201; 2017)	2,592	112
Family Phocidae (earless seals)						
Harbor seal	*Phoca vitulina richardii*	Clarence Strait	-, N	27,659 (See SAE; 24,854; 2015)	746	40

[1] - Endangered Species Act (ESA) status: Endangered (E), Threatened (T)/MMPA status: Depleted (D). A dash (-) indicates that the species is not listed under the ESA or designated as depleted under the MMPA. Under the MMPA, a strategic stock is one for which the level of direct human-caused mortality exceeds PBR or which is determined to be declining and likely to be listed under the ESA within the foreseeable future. Any species or stock listed under the ESA is automatically designated under the MMPA as depleted and as a strategic stock.

[2]- NMFS marine mammal stock assessment reports online at: *https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessments*. CV is coefficient of variation; Nmin is the minimum estimate of stock abundance. In some cases, CV is not applicable (N.A.).

[3] - These values, found in NMFS's SARs, represent annual levels of human-caused mortality plus serious injury (M/SI) from all sources combined (*e.g.*, commercial fisheries, ship strike). Annual M/SI often cannot be determined precisely and is in some cases presented as a minimum value or range. A CV associated with estimated mortality due to commercial fisheries is presented in some cases.

All species that could potentially occur in the proposed survey areas are included in Table 3-1 of the IHA application. However, the spatial occurrence of gray whale and fin whale is such that take is not expected to occur, and they are not discussed further beyond the explanation provided here. Gray whales have not been reported by any local experts or recorded in monitoring reports and it would be extremely unlikely for a gray whale to enter Tongass Narrows or the small portions of Revillagigedo Channel this project would impact. Similarly for fin whale, sightings have not been reported and it would be unlikely for a fin whale to enter the project area as they are generally associated with deeper, more offshore waters. The remaining eight species (with 10 managed stocks) in Table 2 temporally and spatially co-occur with the activity to the degree that take is reasonably likely to occur, and we have proposed authorizing it.

Humpback Whale

Humpback whales are found throughout Southeast Alaska in a variety of marine environments, including open-ocean, near-shore waters, and areas with strong tidal currents (Dahlheim *et al.* 2009). Most humpback whales are migratory and spend winters in the breeding grounds off either Hawaii or Mexico. Humpback whales generally arrive in Southeast Alaska in March and return to their wintering grounds in November. Some humpback whales depart late or arrive early to feeding grounds, and therefore the species occurs in Southeast Alaska year-round (Straley 1990; Straley *et al.* 2018). Current threats to humpback whales include vessel strikes, spills, climate change, and commercial fishing operations (Muto *et al.* 2021).

Humpback whales worldwide were designated as "endangered" under the Endangered Species Conservation Act in 1970, and were listed under the ESA at its inception in 1973. However, on September 8, 2016, NMFS published a final decision that changed the status of humpback whales under the ESA (81 FR 62259), effective October 11, 2016. The decision recognized the existence of 14 DPSs based on distinct breeding areas in tropical and temperate waters. Five of the 14 DPSs were classified under the ESA (4 endangered and 1 threatened), while the other 9 DPSs were delisted. Humpback whales found in the project area are predominantly members of the Hawaii DPS, which is not listed under the ESA. However, based on a comprehensive photo-identification study, members of the Mexico DPS, which is listed as threatened, are known to occur in Southeast Alaska. Members of different DPSs are known to intermix on feeding grounds; therefore, all waters off the coast of Alaska should be considered to have ESA-listed humpback whales. Approximately 2 percent of all humpback whales in Southeast Alaska and northern British Columbia are members of the Mexico DPS, while all others are members of the Hawaii DPS (Wade *et al.* 2021).

The DPSs of humpback whales that were identified through the ESA listing process do not necessarily equate to the existing MMPA stocks. The stock delineations of humpback whales under the MMPA are currently under review. Until this review is complete, NMFS considers humpback whales in Southeast Alaska to be part of the Central North Pacific stock, with a status of endangered under the ESA and designations of strategic and depleted under the MMPA (Muto *et al.* 2021).

Southeast Alaska is considered a biologically important area for feeding humpback whales between March and May (Ellison *et al.* 2012), though not currently designated as critical habitat (86 FR 21082; April 21, 2021). Most humpback whales migrate to other regions during the winter to breed, but rare events of over-wintering humpbacks have been noted, and may be attributable to staggered migration (Straley, 1990; Straley *et al.* 2018). It is thought that those humpbacks that remain in Southeast Alaska do so in response to the availability of winter schools of fish prey, which primarily includes overwintering herring (Straley *et al.* 2018). In Alaska, humpback whales filter feed on tiny crustaceans, plankton, and small fish such as walleye pollock, Pacific sand lance, herring, eulachon, and capelin (Witteveen *et al.* 2012). It is common to observe groups of humpback whales cooperatively bubble feeding. Group sizes in Southeast Alaska generally range from one to four individuals (Dahlheim *et al.* 2009).

No systematic studies have documented humpback whale abundance near Ketchikan. Anecdotal information (See Section 4 of IHA Application) suggests that this species is present in low numbers year-round in Tongass Narrows, with the highest abundance during summer and fall. Anecdotal reports suggest that humpback whales are seen only once or twice per month, while more recently it has been suggested that the occurrence is more regular, such as once per week on average, and more seasonal. Humpbacks observed in Tongass Narrows are generally alone or in groups of one to three individuals. Most humpback whales depart Alaska for their breeding grounds in October and November, and return in March and April. In August 2017, a group of six individuals was observed passing through Tongass Narrows several times per day, for several days in a row. Local residents reported that such high abundance is common in August and September. NMFS reported that in 2018 airport ferry personnel observed a lone humpback whale in the area every few days for several months and a group of two humpback whales every other week (Muto *et al.* 2019).

In the Biological Opinion for this project, NMFS assumed the occurrence of humpback whales in the project area to be one two individuals twice per week, year-round. The assumption was based on differences in abundance throughout the year, recent observations of larger groups of whales present during summer, and a higher than average frequency of occurrence in recent months.

The City of Ketchikan (COK) Rock Pinnacle project, which was located approximately 4 km southeast of the proposed project site, reported one humpback whale sighting of one individual during the project (December 2019 through January 2020) (Sitkiewicz 2020). During the Ward Cove Cruise Ship Dock Construction, located approximately 5 km northwest of the proposed project site, protected species observers (PSOs) observed 28 sightings of humpbacks on eighteen days of in water work that occurred between February and September 2020, with at least one humpback being recorded every month. A total of 42 individuals were recorded and group sizes ranged from solo whales to pods of up to six (Power Systems & Supplies of Alaska 2020). Humpbacks were recorded in each month of construction, with the most individuals (10) being recorded in May, 2020.

Humpback whales were sighted on 17 days out of 88 days of monitoring in Tongass Narrows in 2020 and 2021 (DOT&PF 2020, 2021a, 2021b, 2021c, 2021d). There were no sightings in January or February, but humpback whales were observed each month from October to December 2020 and May to June 2021 (DOT&PF 2020, 2021a, 2021b, 2021c, 2021d). There was only 1 day in June in which humpback whales were observed, but on that day there were four groups of whales—three pairs and one group of four (DOT&PF 2021d). In other months, humpback whale sightings were mostly individual animals and occasionally pairs. During November 2020, a single known individual (by fluke pattern) was observed repeatedly, accounting for 14 of the 26 sighting events that month (DOT&PF 2020). During monitoring, humpback whales were observed on average once a week.

Minke Whale

Minke whales are found throughout the northern hemisphere in polar, temperate, and tropical waters. The population status of minke whales is considered stable throughout most of their range. Historically, commercial whaling reduced the population size of this species, but given their small size, they were never a primary target of whaling and did not experience the severe population declines as did larger cetaceans.

The International Whaling Commission has identified a less concentrated stock throughout the eastern Pacific. NOAA further splits this stock between Alaska whales and resident whales of California, Oregon, and Washington (Muto *et al.,* 2021). Minke whales are found in all Alaska waters. There are no population estimates for minke whales in Alaska. Surveys in Southeast Alaska have consistently identified individuals throughout inland waters in low numbers (Dahlheim *et al.* 2009).

Minke whales in Southeast Alaska are part of the Alaska stock (Muto *et al.* 2021). Dedicated surveys for cetaceans in Southeast Alaska found that minke whales were scattered throughout inland waters from Glacier Bay and Icy Strait to Clarence Strait, with small concentrations near the entrance of Glacier Bay (Dahlheim *et al.* 2009). All sightings were of single minke whales, except for a single sighting of multiple minke whales. Surveys took place in spring, summer, and fall, and minke whales were present in low numbers in all seasons and years. No information appears to be available on the winter occurrence of minke whales in Southeast Alaska.

In Alaska, the minke whale diet consists primarily of euphausiids and walleye pollock. Minke whales are generally found in shallow, coastal waters within 200 m of shore (Zerbini *et al.* 2006) and are almost always solitary or in small groups of 2 to 3. In Alaska, seasonal movements are associated with feeding areas that are generally located at the edge of the pack ice (NMFS 2014).

There are no known occurrences of minke whales within the project area. Since their ranges extend into the project area and they have been observed in southeast Alaska, including in Clarence Strait (Dahlheim *et al.*, 2009), it is possible the species could occur near the project area. During the surveys by Dalheim *et al.* (2009), all but one encounter was with a single whale and, although infrequent, minke whales were observed during all seasons surveyed (spring, summer and fall). No minke whales where reported during the COK Rock Pinnacle Blasting Project (Sitkiewicz 2020). During marine mammal monitoring of Tongass Narrows in 2020 and 2021, there were no minke whales observed on 88 days of observations across 7 months (October 2020–February 2021; May–June 2021) (DOT&PF 2020, 2021a, 2021b, 2021c, 2021d). Future observations of minke whale in the project area are expected to be rare.

Killer Whale

Killer whales have been observed in all the world's oceans, but the highest densities occur in colder and more productive waters found at high latitudes (NMFS 2016). Killer whales occur along the entire Alaska coast, in British Columbia and Washington inland waterways, and along the outer coasts of Washington, Oregon, and California (NMFS 2016).

Based on data regarding association patterns, acoustics, movements, and genetic differences, eight killer whale stocks are now recognized within the Pacific U.S. Exclusive Economic Zone. This proposed IHA considers only the Eastern North Pacific Alaska Resident stock (Alaska Resident stock), Eastern North Pacific Northern Resident stock (Northern Resident stock), and West Coast Transient stock, because all other stocks occur outside the geographic area under consideration (Muto *et al.,* 2021).

There are three distinct ecotypes, or forms, of killer whales recognized: Resident, Transient, and Offshore. The three ecotypes differ morphologically, ecologically, behaviorally, and genetically. Surveys between 1991 and 2007 encountered resident killer whales during all seasons throughout Southeast Alaska. Both residents and transients were common in a variety of habitats and all major waterways, including protected bays and inlets. There does not appear to be strong seasonal variation in abundance or distribution of killer whales, but there was substantial variability between years during this study (Dahlheim *et al.,* 2009). Spatial distribution has been shown to vary among the different ecotypes, with resident and, to a lesser extent, transient killer whales more commonly observed along the continental shelf, and offshore killer whales more commonly observed in pelagic waters (Rice *et al.*, 2021).

No systematic studies of killer whales have been conducted in or around Tongass Narrows. Killer whales have been observed in Tongass Narrows year-round and are most common during the summer Chinook salmon run (May-July). During the Chinook salmon run, Ketchikan residents have reported pods of 20-30 whales and during the 2016/2017 winter a pod of 5 whales was observed in Tongass Narrows (84 FR 36891; July 30, 2019). Typical pod sizes observed within the project vicinity range from 1 to 10 animals and the frequency of killer whales passing through the action area is estimated to be once per month (Frietag 2017). Anecdotal reports suggest that large pods of killer whales (as many as 80 individuals, but generally between 25 and 40 individuals) are not uncommon in May, June, and July when the king salmon are running. During the rest of the year, killer whales occur irregularly in pods of 6 to 12 or more individuals. Large pods would be indicative of the Alaska resident population, which travels and hunts in large social groups.

Transient killer whales are often found in long-term stable social units (pods) of 1 to 16 whales. Average pod sizes in Southeast Alaska were 6.0 in spring, 5.0 in summer, and 3.9 in fall. Pod sizes of transient whales are generally smaller than those of resident social groups. Resident killer whales occur in larger pods, ranging from 7 to 70 whales that are seen in association with one another more than 50 percent of the time (Dahlheim *et al.,* 2009; NMFS 2016b). In Southeast Alaska, resident killer whale mean pod size was approximately 21.5 in spring, 32.3 in summer, and 19.3 in fall (Dahlheim *et al.,* 2009).

Although killer whales may occur in large numbers, they generally form large pods and would incur fewer work stoppages than their numbers suggest. Killer whales tend to transit through Tongass Narrows, and do not linger in the project area.

Marine mammal observations in Tongass Narrows during 2020 and 2021 support an estimate of approximately one group of killer whales a month in the project area. During 7 months of monitoring (October 2020–February 2021; May–June 2021), there were five killer whale sightings in 4 months (November, February, May, June) totaling 22 animals and sightings occurred on 5 out of 88 days of monitoring (DOT&PF 2020, 2021a, 2021b, 2021c, 2021d). Pod sizes ranged from two to eight animals (DOT&PF 2020, 2021a, 2021b, 2021c, 2021d). During the COK's monitoring for the Rock Pinnacle Removal project in December 2019 and January 2020, no killer whales were observed (Sitkiewicz 2020). Over 8 months of monitoring at the Ward Cove Cruise Ship Dock in 2020, killer whales were only observed on two days in March (Power Systems and Supplies of Alaska, 2020). These observations included a sighting of one pod of two killer whales and a second pod of five individuals travelling through the project area.

Pacific White-sided Dolphin

Pacific white-sided dolphins are a pelagic species inhabiting temperate waters of the North Pacific Ocean and along the coasts of California, Oregon, Washington, and Alaska (Muto *et al.,* 2021). Despite their distribution mostly in deep, offshore waters, they may also be found over the continental shelf and near shore waters, including inland waters of Southeast Alaska (Ferrero and Walker 1996). The North Pacific stock is found within the project area. The Pacific white-sided dolphin is distributed throughout the temperate North Pacific Ocean, north of Baja California to Alaska's southern coastline and Aleutian Islands. The North Pacific Stock ranges from Canada into Alaska (Muto *et al.*, 2021).

Pacific white-sided dolphins prey on squid and small schooling fish such as capelin, sardines, and herring (Morton 2006). They are known to work in groups to herd schools of fish and can dive underwater for up to 6 minutes to feed (Morton 2006). Group sizes have been reported to range from 40 to over 1,000 animals, but groups of between 10 and 100 individuals (Stacey and Baird 1991) occur most commonly. Seasonal movements of Pacific white-sided dolphins are not well understood, but there is evidence of both north-south seasonal movement (Leatherwood *et al.* 1984) and inshore-offshore seasonal movement (Stacey and Baird 1991).

Scientific studies and data are lacking relative to the presence or abundance of Pacific white-sided dolphins in or near Tongass Narrows. Although they generally prefer deeper and more-offshore waters, anecdotal reports suggest that Pacific white-sided dolphins have previously been observed in Tongass Narrows, although they have not been observed entering Tongass Narrows or nearby inter-island waterways in 15–20 years.

Pacific white-sided dolphins are rare in the inside passageways of Southeast Alaska. Most observations occur off the outer coast or in inland waterways near entrances to the open ocean. According to Muto *et al.* (2018), aerial surveys in 1997 sighted one group of 164 Pacific white-sided dolphins in Dixon entrance to the south of Tongass Narrows. Surveys in April and May from 1991 to 1993 identified Pacific white-sided dolphins in Revillagigedo Channel, Behm Canal, and Clarence Strait (Dahlheim and

Towell 1994). These areas are contiguous with the open ocean waters of Dixon Entrance. Dalheim *et al.* (2009) frequently encountered Pacific white-sided dolphin in Clarence Strait with significant differences in mean group size and rare enough encounters to limit the seasonality investigation to a qualitative note that spring featured the highest number of animals observed. These observations were noted most typically in open strait environments, near the open ocean. Mean group size was over 20, with no recorded winter observations nor observations made in the Nichols Passage or Behm Canal, located on either side of the Tongass Narrows. Though generally preferring more pelagic, open-water environments, Pacific white-sided dolphin could be present within the action area during the construction period. This observational data, combined with anecdotal information, indicates there is a rare, however, slight potential for Pacific white-sided dolphins to occur in the project area.

During marine mammal monitoring of Tongass Narrows in 2020 and 2021, no Pacific white-sided dolphins were observed on 88 days of observations across 7 months (October 2020–February 2021; May–June 2021), which supports the anecdotal evidence that sightings of this species are rare (DOT&PF 2020, 2021a, 2021b, 2021c, 2021d). There were also no sightings of Pacific white-sided dolphins during the COK Rock Pinnacle Blasting Project during monitoring surveys conducted in December 2019 and January 2020 (Sitkiewicz 2020) or during monitoring surveys conducted between February and September 2020 as part of the Ward Cove Cruise Ship Dock (Power Systems and Supplies of Alaska, 2020).

Harbor Porpoise

In the eastern North Pacific Ocean, the harbor porpoise ranges from Point Barrow, along the Alaska coast, and down the west coast of North America to Point Conception, California. In Alaska, harbor porpoises are currently divided into three stocks, based primarily on geography: the Bering Sea stock, the Southeast Alaska stock, and the Gulf of Alaska stock. The Southeast Alaska stock ranges from Cape Suckling to the Canadian border (Muto *et al.* 2021). Harbor porpoises frequent primarily coastal waters in Southeast Alaska (Dahlheim *et al.* 2009) and occur most frequently in waters less than 100 m (328 ft) deep (Hobbs and Waite 2010; Dahlheim *et al.* 2015).

Abundance data for harbor porpoises in Southeast Alaska were collected during 18 seasonal surveys spanning 22 years, from 1991 to 2012 (Dahlheim *et al.* 2015). The project area and Tongass Narrows fall within the Clarence Strait to Ketchikan region, as identified by this study for the survey effort. Harbor porpoise densities in this region in summer were low, ranging from 0.01 to 0.02 harbor porpoises/km^2.

Studies of harbor porpoises reported no evidence of seasonal changes in distribution for the inland waters of Southeast Alaska (Dahlheim *et al.* 2009). Their small overall size, lack of a visible blow, low dorsal fins and overall low profile, and short surfacing time make them difficult to observe (Dahlheim *et al.* 2015), likely reducing identification and reporting of this species, and these estimates therefore may be low.

Calving occurs from May to August; however, this can vary by region. Harbor porpoises are often found traveling alone, or in small groups less than 10 individuals (Schmale 2008). According to aerial surveys of harbor porpoise abundance in Alaska conducted in 1991–1993, mean group size in Southeast Alaska was calculated to be 1.2 animals (Dahlheim *et al.* 2000).

Anecdotal reports (see Section 3 of the IHA Application) specific to Tongass Narrows indicate that harbor porpoises are rarely observed in the project area, and actual sightings are less common than those suggested by Dahlheim *et al.* (2015). Harbor porpoises prefer shallower waters (Dahlheim *et al.* 2015) and generally are not attracted to areas with elevated levels of vessel activity and noise such as Tongass Narrows. Harbor porpoises are expected to be present in the project area only a few times per year. Freitag (2017 as cited in 83 FR 22009; May 11, 2018) observed harbor porpoises in

Tongass Narrows zero to one time per month and NMFS (83 FR 22009; May 11, 2018) has estimated that one group of harbor porpoises would enter Tongass Narrows each month.

Harbor porpoises were sighted on 3 days of in-water work during monitoring associated with the Ward Cove Cruise Ship Dock, with three sightings of 15 individuals sighted in March and April, 2020 (Power Systems and Supplies of Alaska, 2020). Solo individuals and pods of up to 10 were identified as swimming and travelling 2,500 m to 2,800 m from in-water work. During marine mammal monitoring of Tongass Narrows in 2020 and 2021, no harbor porpoises were observed on 88 days of observations across 7 months (October 2020–February 2021; May–June 2021), which supports the anecdotal evidence that harbor porpoise sightings are rare (DOT&PF 2020, 2021a, 2021b, 2021c, 2021d). Marine mammal monitoring associated with the COK Rock Pinnacle Removal project also did not observe any harbor porpoise during surveys conducted in December 2019 and January 2020 (Sitkiewicz 2020).

Dall's Porpoise

Dall's porpoises are found throughout the North Pacific, from southern Japan to southern California north to the Bering Sea. Dall's porpoises are not listed as endangered or threatened under the ESA. All Dall's porpoises in Alaska are members of the Alaska stock, and those off California, Oregon, and Washington are part of a separate stock. This species can be found in offshore, inshore, and nearshore habitat, but prefer waters more than 600 ft (180 m) deep (Jefferson 2009).

No systematic studies of Dall's porpoise abundance or distribution have occurred in Tongass Narrows; however, surveys for cetaceans throughout Southeast Alaska were conducted between 1991 and 2007 (Dahlheim *et al.* 2009). The species is generally found in waters in excess of 600 ft (183 m) deep (Dahlheim *et al.* 2009, Jefferson 2009), which do not occur in Tongass Narrows. Jefferson *et al.* (2019) presents historical survey data showing few sightings in the Ketchikan area, and based on these occurrence patterns, concludes that Dall's porpoise rarely come into narrow waterways, like Tongass Narrows. Anecdotal reports suggest that Dall's porpoises are found northwest of Ketchikan near the Guard Islands, where waters are deeper, as well as in deeper waters to the southeast of Tongass Narrows. Should Dall's porpoises occur in the project area, they would likely be present in March or April, given past observations in the region. Despite generalized water depth preferences, Dall's porpoises may occur in shallower waters. This species has a tendency to bow-ride with vessels and may occur in the project area incidentally a few times per year.

The mean group size in Southeast Alaska is estimated at approximately three individuals (Dahlheim *et al.* 2009; Jefferson 2019). However, in the Ketchikan vicinity, Dall's porpoises are reported to typically occur in groups of 10-15 animals, with an estimated maximum group size of 20 animals (Freitag 2017, 83 FR 37473; August 1, 2018).

Dall's porpoises were positively identified on 2 days of in-water work during monitoring associated with the Ward Cove Cruise Ship Dock (Power Systems and Supplies of Alaska, 2020). A pod of three and a pod of five were recorded travelling at least 3,000 m from the construction site in April and May, respectively. During marine mammal monitoring of Tongass Narrows in 2020 and 2021, there were sightings of Dall's porpoises on 2 out of 88 days of observations across 7 months (October 2020–February 2021; May–June 2021)—once in November 2020 and once in February 2021. The pod sighted in November contained six animals; the pod observed in February had 10. Based on this recent data, there is no known pattern to their attendance in the project area, but they do occur rarely (DOT&PF 2020, 2021a, 2021b, 2021c, 2021d).

Steller Sea Lion

Steller sea lions were listed as threatened range-wide under the ESA on November 26, 1990 (55 FR 49204). Steller sea lions were subsequently partitioned into the western and eastern DPSs (and MMPA stocks) in 1997 (62 FR 24345; May 5, 1997). The eastern DPS remained classified as threatened until it was delisted in November 2013. The current minimum abundance estimate for the eastern DPS of Steller sea lions is 43,201 individuals (Muto *et al.* 2021). The western DPS (those individuals west of 144° W longitude or Cape Suckling, Alaska) was upgraded to endangered status following separation of the DPSs, and it remains endangered today. There is regular movement of both DPSs across this 144° W longitude boundary (Jemison *et al.* 2013), however, due to the distance from this DPS boundary, it is likely that only eastern DPS Steller sea lions are present in the project area. Therefore, animals potentially affected by the project are assumed to be part of the eastern DPS.

There are several mapped and regularly monitored long-term Steller sea lion haulouts surrounding Ketchikan, such as West Rocks (36 miles/58 km) or Nose Point (37 miles/60 km), but none are known to occur within Tongass Narrows (Fritz *et al.* 2015). The nearest known Steller sea lion haulout is located approximately 20 miles (58 km) west/northwest of Ketchikan on Grindall Island (Figure 4-1 in application). Summer counts of adult and juvenile sea lions at this haulout since 2000 have averaged approximately 191 individuals, with a range from 6 in 2009 to 378 in 2008. Only two winter surveys of this haulout have occurred. In March 1993, a total of 239 individuals were recorded, and in December 1994, a total of 211 individuals were recorded. No sea lion pups have been observed at this haulout during surveys. Although this is a limited and dated sample, it suggests that abundance may be consistent year-round at the Grindall Island haulout.

No systematic studies of sea lion abundance or distribution have occurred in Tongass Narrows. Anecdotal reports suggest that Steller sea lions may be found in

Tongass Narrows year-round, with an increase in abundance from March to early May during the herring spawning season, and another increase in late summer associated with salmon runs. Overall sea lion presence in Tongass Narrows tends to be lower in summer than in winter (FHWA 2017). During summer, Steller sea lions may aggregate outside the project area, at rookery and haulout sites. Monitoring during construction of the Ketchikan Ferry Terminal in summer (July 16 through August 17, 2016) did not record any Steller sea lions (ADOT&PF 2015); however, monitoring during construction of the Ward Cove Dock, located approximately 6 km northwest of the Project site, recorded 181 individual sea lions on 44 days between February and September 2020 (Power Systems & Supplies of Alaska, 2020). Most sightings occurred in February (45 sightings of 88 sea lions) and March (34 sightings of 45 sea lions); the fewest number of sightings were observed in May (1 sighting of 1 sea lion) (Power Systems & Supplies of Alaska, 2020). Sightings were of single individuals, pairs, and herds of up to 10 individuals.

Sea lions are known to transit through Tongass Narrows while pursuing prey. Steller sea lions are also known to follow fishing vessels, and may congregate in small numbers at seafood processing facilities and hatcheries or at the mouths of rivers and creeks containing hatcheries, where large numbers of salmon congregate in late summer. Three seafood processing facilities are located east of the proposed berth location on Revilla Island, and two salmon hatcheries operated by the Alaska Department of Fish & Game (ADF&G) are located east of the project area. Steller sea lions may aggregate near the mouth of Ketchikan Creek, where a hatchery upstream supports a summer salmon run. The Creek mouth is more than 4 km (2.5 mi) from both ferry berth sites, and is positioned behind the cruise ship terminal and within the small boat harbor. In addition to these locations, anecdotal information from a local kayaking company suggests that there are Steller sea lions present at Gravina Point, near the southwest entrance to Tongass Narrows.

A total of 181 Steller sea lions were sighted on 44 separate days during all months of Ward Cove Cruise Ship Dock construction (February through September, 2020) (Power Systems and Supplies of Alaska, 2020). Most sightings occurred in February and March and the fewest sightings were in May. Sightings were of single individuals, pairs, and herds of up to 10 individuals.

The DOT&PF implemented a marine mammal monitoring program in Tongass Narrows for recent previous construction components of the Tongass Narrows Project (84 FR 34134; July 17, 2019). Monitoring took place from October 2020 through February 2021 and May through June 2021, and results indicated that Steller sea lion numbers were highest in January and February (DOT&PF 2020, 2021a, 2021b, 2021c, 2021d). Steller sea lions were observed in the Tongass Narrows Project area on 49 of 88 days between October 2020 and June 2021 (DOT&PF 2020, 2021a, 2021b, 2021c, 2021d). They were observed in every month that observations took place (DOT&PF 2020, 2021a, 2021b, 2021c, 2021d). Over the course of the 7 months of monitoring, there were 77 sightings of 92 individual animals (DOT&PF 2020, 2021a, 2021b, 2021c, 2021d). Sightings of Steller sea lions were most frequent in January and February and least common in May and June (DOT&PF 2020, 2021a, 2021b, 2021c, 2021d). Sightings were primarily of single animals, but animals were also present in pairs and groups up to five sea lions (DOT&PF 2020, 2021a, 2021b, 2021c, 2021d). This is consistent with Freitag (2017 as cited in 83 FR 22009; May 11, 2018), though groups of up to 80 individuals have been observed (HDR, Inc. 2003). On average over the course of a year, Steller sea lions occur in Tongass Narrows approximately three or four times per week (DOT&PF 2020, 2021a, 2021b, 2021c, 2021d).

Harbor Seal

Harbor seals range from Baja California north along the west coasts of Washington, Oregon, California, British Columbia, and Southeast Alaska; west through the Gulf of Alaska, Prince William Sound, and the Aleutian Islands; and north in the Bering Sea to Cape Newenham and the Pribilof Islands. In 2010, harbor seals in Alaska were partitioned into 12 separate stocks based largely on genetic structure (Allen and Angliss 2010). Harbor seals in Tongass Narrows are recognized as part of the Clarence Strait stock. Distribution of the Clarence Strait stock ranges from the east coast of Prince of Wales Island from Cape Chacon north through Clarence Strait to Point Baker and along the east coast of Mitkof and Kupreanof Islands north to Bay Point, including Ernest Sound, Behm Canal, and Pearse Canal (Muto *et al.* 2021). The latest stock assessment analysis indicates that the current 8-year estimate of the Clarence Strait population trend is +138 seals per year, with a probability that the stock is decreasing of 0.413 (Muto *et al.* 2021). Harbor seals haul out on rocks, reefs, beaches, and drifting glacial ice, and feed in marine, estuarine, and occasionally fresh waters. Harbor seals are generally non-migratory, with local movements associated with such factors as tides, weather, season, food availability, and reproduction (Muto, *et al.* 2021).

No systematic studies of harbor seal abundance or distribution have occurred in Tongass Narrows. Aerial surveys conducted in August 2011 did not record any harbor seal haulouts in Tongass Narrows, but several haulouts were located on the outer shores of Gravina Island (London *et al.* 2015). There is no known harbor seal haulout in Tongass Narrows although seals have been observed hauled out on docks in Ketchikan Harbor. The closest listed haulout is located off the tip of Gravina Island, approximately 8 km (5 mi) northwest of Ward Cove (AFSC 2018).

Anecdotal observations indicate that harbor seals are common in Tongass Narrows, although no data exist to quantify abundance. Two salmon hatcheries operated by ADF&G are located east of the project area. Like Steller sea lions, harbor seals may aggregate near the mouth of Ketchikan Creek when salmon are running in summer. The creek mouth is more than 4 km (2.5 mi) from the project component sites, and is positioned behind both the cruise ship terminal and within the small boat harbor. In the project area, they tend to be more abundant during spring, summer and fall months when salmon are present in Ward Creek. Anecdotal evidence indicates that harbor seals typically occur in groups of 1-3 animals in Ward Cove (Spokely 2019). They were not observed in Tongass Narrows during a combined 63.5 hours of marine mammal monitoring that took place in 2001 and 2016 (OSSA 2001, Turnagain 2016). The COK conducted pinnacle rock blasting in December 2019 and January 2020 near the vicinity of the proposed project and recorded a total of 21 harbor seal sightings of 24 individuals over 76.2 hours of pre- and post-blast monitoring (Sitkiewicz 2020).

Harbor seals were sighted during every month of construction (February through September, 2020) associated with the Ward Cove Cruise Ship Dock, with most sightings in February and March and the fewest in July (Power Systems and Supplies of Alaska, 2020). There were 247 sighting events of 271 individuals. Sighting events were of solo individuals, pairs, and the occasional group of three.

Marine mammal monitoring occurred near the project site from October 2020 to February 2021 and resumed in May 2021 during Phase 1 of the previously issued IHA (85 FR 673; January 7, 2020). Harbor seals were observed in the Tongass Narrows Project area in every month in which observations took place, except during October 2020 when only 3 days of monitoring occurred (DOT&PF 2020, 2021a, 2021b, 2021c, 2021d). Harbor seals were sighted on 68 days out of 88 days of monitoring (DOT&PF 2020, 2021a, 2021b, 2021c, 2021d). They were mostly sightings of single animals, but animals were also present in pairs and groups up to five seals (DOT&PF 2020, 2021a, 2021b, 2021c, 2021d). Sightings of harbor seals were consistent over the course of 7 months of intermittent monitoring; they were observed 5 to 6 days per week on average (DOT&PF 2020, 2021a, 2021b, 2021c, 2021d).

Marine Mammal Hearing

Hearing is the most important sensory modality for marine mammals underwater, and exposure to anthropogenic sound can have deleterious effects. To appropriately assess the potential effects of exposure to sound, it is necessary to understand the frequency ranges marine mammals are able to hear. Current data indicate that not all marine mammal species have equal hearing capabilities (*e.g.*, Richardson *et al.* 1995; Wartzok and Ketten, 1999; Au and Hastings, 2008). To reflect this, Southall *et al.* (2007) recommended that marine mammals be divided into functional hearing groups based on directly measured or estimated hearing ranges on the basis of available behavioral response data, audiograms derived using auditory evoked potential techniques, anatomical modeling, and other data. Note that no direct measurements of hearing ability have been successfully completed for mysticetes (*i.e.*, low-frequency cetaceans). Subsequently, NMFS (2018) described generalized hearing ranges for these marine mammal hearing groups. Generalized hearing ranges were chosen based on the approximately 65 decibel (dB) threshold from the normalized composite audiograms, with the exception for lower limits for low-frequency cetaceans where the lower bound was deemed to be biologically implausible and the lower bound from Southall *et al.* (2007) retained. Marine mammal hearing groups and their associated hearing ranges are provided in Table 3.

Table 3--Marine Mammal Hearing Groups (NMFS, 2018)

Hearing Group	Generalized Hearing Range*
Low-frequency (LF) cetaceans (baleen whales)	7 Hz to 35 kHz
Mid-frequency (MF) cetaceans (dolphins, toothed whales, beaked whales, bottlenose whales)	150 Hz to 160 kHz
High-frequency (HF) cetaceans (true porpoises, *Kogia*, river dolphins, cephalorhynchid, *Lagenorhynchus cruciger* & *L. australis*)	275 Hz to 160 kHz
Phocid pinnipeds (PW) (underwater) (true seals)	50 Hz to 86 kHz
Otariid pinnipeds (OW) (underwater) (sea lions and fur seals)	60 Hz to 39 kHz
* Represents the generalized hearing range for the entire group as a composite (*i.e.,* all species within the group), where individual species' hearing ranges are typically not as broad. Generalized hearing range chosen based on ~65 dB threshold from normalized composite audiogram, with the exception for lower limits for LF cetaceans (Southall *et al.* 2007) and PW pinniped (approximation).	

The pinniped functional hearing group was modified from Southall *et al.* (2007) on the basis of data indicating that phocid species have consistently demonstrated an extended frequency range of hearing compared to otariids, especially in the higher frequency range (Hemilä *et al.* 2006; Kastelein *et al.* 2009; Reichmuth and Holt, 2013).

For more detail concerning these groups and associated frequency ranges, please see NMFS (2018) for a review of available information. Eight marine mammal species (six cetacean and two pinniped (one otariid and one phocid) species) have the reasonable potential to co-occur with the proposed survey activities. Please refer to Table 2. Of the cetacean species that may be present, two are classified as low-frequency cetaceans (*i.e.*, all mysticete species), two are classified as mid-frequency cetaceans (*i.e.*, all delphinid and ziphiid species and the sperm whale), and two are classified as high-frequency cetaceans (*i.e.*, harbor porpoise, Dall's porpoise and *Kogia spp*.).

Potential Effects of Specified Activities on Marine Mammals and their Habitat

This section includes a summary and discussion of the ways that components of the specified activity may impact marine mammals and their habitat. The **Estimated Take** section later in this document includes a quantitative analysis of the number of individuals that are expected to be taken by this activity. The **Negligible Impact Analysis and Determination** section considers the content of this section, the **Estimated Take** section, and the **Proposed Mitigation** section, to draw conclusions regarding the likely impacts of these activities on the reproductive success or survivorship of individuals and how those impacts on individuals are likely to impact marine mammal species or stocks.

Acoustic effects on marine mammals during the specified activity can occur from impact and vibratory pile driving and removal and use of DTH equipment. The effects of underwater noise from ADOT's proposed activities have the potential to result in Level A or Level B harassment of marine mammals in the action area.

Description of Sound Sources

The marine soundscape is comprised of both ambient and anthropogenic sounds. Ambient sound is defined as the all-encompassing sound in a given place and is usually a composite of sound from many sources both near and far (ANSI 1995). The sound level of an area is defined by the total acoustical energy being generated by known and unknown sources. These sources may include physical (*e.g.*, waves, wind, precipitation, earthquakes, ice, atmospheric sound), biological (*e.g.*, sounds produced by marine mammals, fish, and invertebrates), and anthropogenic sound (*e.g.*, vessels, dredging, aircraft, construction).

The sum of the various natural and anthropogenic sound sources at any given location and time—which comprise "ambient" or "background" sound—depends not only on the source levels (as determined by current weather conditions and levels of biological and shipping activity) but also on the ability of sound to propagate through the environment. In turn, sound propagation is dependent on the spatially and temporally varying properties of the water column and sea floor, and is frequency-dependent. As a result of the dependence on a large number of varying factors, ambient sound levels can be expected to vary widely over both coarse and fine spatial and temporal scales. Sound levels at a given frequency and location can vary by 10-20 dB from day to day (Richardson *et al.* 1995). The result is that, depending on the source type and its intensity, sound from the specified activity may be a negligible addition to the local environment or could form a distinctive signal that may affect marine mammals.

In-water construction activities associated with the project would include impact pile driving, vibratory pile driving and removal, and use of DTH equipment. The sounds produced by these activities fall into one of two general sound types: Impulsive and non-impulsive. Impulsive sounds (*e.g.,* explosions, gunshots, sonic booms, impact pile driving) are typically transient, brief (less than 1 second), broadband, and consist of high peak sound pressure with rapid rise time and rapid decay (ANSI 1986; NIOSH 1998; NMFS 2018). Non-impulsive sounds (*e.g.* aircraft, machinery operations such as drilling or dredging, vibratory pile driving, and active sonar systems) can be broadband, narrowband or tonal, brief or prolonged (continuous or intermittent), and typically do not have the high peak sound pressure with rapid rise/decay time that impulsive sounds do (ANSI 1995; NIOSH 1998; NMFS 2018). The distinction between these two sound types is important because they have differing potential to cause physical effects, particularly with regard to hearing (*e.g.*, Ward 1997 in Southall *et al.* 2007).

Three types of hammers would be used on this project: impact, vibratory, and DTH. Impact hammers operate by repeatedly dropping and/or pushing a heavy piston onto a pile to drive the pile into the substrate. Sound generated by impact hammers is characterized by rapid rise times and high peak levels, a potentially injurious combination (Hastings and Popper 2005). Vibratory hammers install piles by vibrating them and allowing the weight of the hammer to push them into the sediment. Vibratory hammers produce significantly less sound than impact hammers. Peak Sound Pressure Levels (SPLs) may be 180 dB or greater, but are generally 10 to 20 dB lower than SPLs generated during impact pile driving of the same-sized pile (Oestman *et al.* 2009). Rise time is slower, reducing the probability and severity of injury, and sound energy is distributed over a greater amount of time (Nedwell and Edwards 2002; Carlson *et al.* 2005).

A DTH hammer is essentially a drill bit that drills through the bedrock using a rotating function like a normal drill, in concert with a hammering mechanism operated by a pneumatic (or sometimes hydraulic) component integrated into to the DTH hammer to increase speed of progress through the substrate *(i.e.*, it is similar to a "hammer drill" hand tool). The sounds produced by the DTH method contain both a continuous non-impulsive component from the drilling action and an impulsive component from the hammering effect. Therefore, we treat DTH systems as both impulsive and continuous, non-impulsive sound source types simultaneously.

The likely or possible impacts of ADOT's proposed activity on marine mammals could involve both non-acoustic and acoustic stressors. Potential non-acoustic stressors could result from the physical presence of the equipment and personnel; however, any impacts to marine mammals are expected to primarily be acoustic in nature. Acoustic stressors include effects of heavy equipment operation during pile installation and removal and use of DTH.

Acoustic Impacts

The introduction of anthropogenic noise into the aquatic environment from pile driving and removal and DTH is the primary means by which marine mammals may be harassed from ADOT's specified activity. In general, animals exposed to natural or anthropogenic sound may experience physical and psychological effects, ranging in magnitude from none to severe (Southall *et al.* 2007, 2019). In general, exposure to pile driving and DTH noise has the potential to result in auditory threshold shifts and behavioral reactions (*e.g.*, avoidance, temporary cessation of foraging and vocalizing, changes in dive behavior). Exposure to anthropogenic noise can also lead to non-observable physiological responses such an increase in stress hormones. Additional noise in a marine mammal's habitat can mask acoustic cues used by marine mammals to carry out daily functions such as communication and predator and prey detection. The effects of pile driving and DTH noise on marine mammals are dependent on several factors, including, but not limited to, sound type (*e.g.,* impulsive vs. non-impulsive), the species, age and sex class (*e.g.,* adult male vs. mom with calf), duration of exposure, the distance between the pile and the animal, received levels, behavior at time of exposure, and previous history with exposure (Wartzok *et al.* 2004; Southall *et al.* 2007). Here we discuss physical auditory effects (threshold shifts) followed by behavioral effects and potential impacts on habitat.

NMFS defines a noise-induced threshold shift (TS) as a change, usually an increase, in the threshold of audibility at a specified frequency or portion of an individual's hearing range above a previously established reference level (NMFS 2018). The amount of threshold shift is customarily expressed in dB. A TS can be permanent or temporary. As described in NMFS (2018), there are numerous factors to consider when examining the consequence of TS, including, but not limited to, the signal temporal pattern (*e.g.,* impulsive or non-impulsive), likelihood an individual would be exposed for a long enough duration or to a high enough level to induce a TS, the magnitude of the TS, time to recovery (seconds to minutes or hours to days), the frequency range of the exposure (*i.e.,* spectral content), the hearing and vocalization frequency range of the exposed species relative to the signal's frequency spectrum (*i.e.,* how animal uses sound within the frequency band of the signal; *e.g.,* Kastelein *et al.* 2014), and the overlap between the animal and the source (*e.g.,* spatial, temporal, and spectral).

Permanent Threshold Shift (PTS)—NMFS defines PTS as a permanent, irreversible increase in the threshold of audibility at a specified frequency or portion of an individual's hearing range above a previously established reference level (NMFS 2018). Available data from humans and other terrestrial mammals indicate that a 40 dB threshold shift approximates PTS onset (see Ward *et al.* 1958, 1959; Ward 1960; Kryter *et al.* 1966; Miller 1974; Ahroon *et al.* 1996; Henderson *et al.* 2008). PTS levels for marine mammals are estimates, as with the exception of a single study unintentionally inducing PTS in a harbor seal (Kastak *et al.* 2008), there are no empirical data measuring PTS in marine mammals largely due to the fact that, for various ethical reasons, experiments involving anthropogenic noise exposure at levels inducing PTS are not typically pursued or authorized (NMFS 2018).

Temporary Threshold Shift (TTS)—A temporary, reversible increase in the threshold of audibility at a specified frequency or portion of an individual's hearing range above a previously established reference level (NMFS 2018). Based on data from cetacean TTS measurements (see Southall *et al.* 2007), a TTS of 6 dB is considered the minimum threshold shift clearly larger than any day-to-day or session-to-session variation in a subject's normal hearing ability (Schlundt *et al.* 2000; Finneran *et al.* 2000, 2002). As described in Finneran (2015), marine mammal studies have shown the amount of TTS increases with cumulative sound exposure level (SELcum) in an accelerating fashion: At low exposures with lower SELcum, the amount of TTS is typically small and the growth curves have shallow slopes. At exposures with higher SELcum, the growth curves become steeper and approach linear relationships with the noise SEL.

Depending on the degree (elevation of threshold in dB), duration (*i.e.,* recovery time), and frequency range of TTS, and the context in which it is experienced, TTS can have effects on marine mammals ranging from discountable to serious (similar to those discussed in auditory masking, below). For example, a marine mammal may be able to readily compensate for a brief, relatively small amount of TTS in a non-critical frequency range that takes place during a time when the animal is traveling through the open ocean, where ambient noise is lower and there are not as many competing sounds present. Alternatively, a larger amount and longer duration of TTS sustained during time when communication is critical for successful mother/calf interactions could have more serious impacts. We note that reduced hearing sensitivity as a simple function of aging has been observed in marine mammals, as well as humans and other taxa (Southall *et al.* 2007), so we can infer that strategies exist for coping with this condition to some degree, though likely not without cost.

Currently, TTS data only exist for four species of cetaceans (bottlenose dolphin (*Tursiops truncatus*), beluga whale (*Delphinapterus leucas*), harbor porpoise, and Yangtze finless porpoise (*Neophocoena asiaeorientalis*)) and five species of pinnipeds exposed to a limited number of sound sources (*i.e.,* mostly tones and octave-band noise) in laboratory settings (Finneran 2015). TTS was not observed in trained spotted (*Phoca largha*) and ringed (*Pusa hispida*) seals exposed to impulsive noise at levels matching previous predictions of TTS onset (Reichmuth *et al.* 2016). In general, harbor seals and harbor porpoises have a lower TTS onset than other measured pinniped or cetacean species (Finneran 2015). Additionally, the existing marine mammal TTS data come from a limited number of individuals within these species. No data are available on noise-induced hearing loss for mysticetes. For summaries of data on TTS in marine mammals or for further discussion of TTS onset thresholds, please see Southall *et al.* (2007), Finneran and Jenkins (2012), Finneran (2015), and Table 5 in NMFS (2018).

Installing piles requires a combination of impact pile driving, vibratory pile driving, and DTH. For the project, these activities may occur at the same time (up to two hammers of any combination of hammer/drill type), though such an occurrence is anticipated to be infrequent and for short durations on any given day, given that pile installation and removal occurs intermittently to allow for adjusting piles and measuring and documenting progress. Therefore, there would likely be pauses in activities producing the sound during each day. Given these pauses and that many marine mammals are likely moving through the project area and not remaining for extended periods of time, the potential for TS declines.

Behavioral Harassment—Exposure to noise from pile driving and removal and DTH also has the potential to behaviorally disturb marine mammals. Available studies show wide variation in response to underwater sound; therefore, it is difficult to predict specifically how any given sound in a particular instance might affect marine mammals perceiving the signal. If a marine mammal does react briefly to an underwater sound by changing its behavior or moving a small distance, the impacts of the change are unlikely to be significant to the individual, let alone the stock or population. However, if a sound source displaces marine mammals from an important feeding or breeding area for a prolonged period, impacts on individuals and populations could be significant (*e.g.,* Lusseau and Bejder 2007; Weilgart 2007; NRC 2005).

Disturbance may result in changing durations of surfacing and dives, number of blows per surfacing, or moving direction and/or speed; reduced/increased vocal activities; changing/cessation of certain behavioral activities (such as socializing or feeding); visible startle response or aggressive behavior (such as tail/fluke slapping or jaw clapping); avoidance of areas where sound sources are located. Pinnipeds may increase their haul out time, possibly to avoid in-water disturbance (Thorson and Reyff 2006). Behavioral responses to sound are highly variable and context-specific and any reactions depend on numerous intrinsic and extrinsic factors (*e.g.,* species, state of maturity, experience, current activity, reproductive state, auditory sensitivity, time of day), as well as the interplay between factors (*e.g.,* Richardson *et al.* 1995; Wartzok *et al.* 2003; Southall *et al.* 2007; Weilgart 2007; Archer *et al.* 2010). Behavioral reactions can vary not only among individuals but also within an individual, depending on previous experience with a sound source, context, and numerous other factors (Ellison *et al.* 2012), and can vary depending on characteristics associated with the sound source (*e.g.,* whether it is moving or stationary, number of sources, distance from the source). In general, pinnipeds seem more tolerant of, or at least habituate more quickly to, potentially disturbing underwater sound than do cetaceans, and generally seem to be less responsive to exposure to industrial sound than most cetaceans. Please see Appendices B and C of Southall *et al.* (2007) for a review of studies involving marine mammal behavioral responses to sound.

Disruption of feeding behavior can be difficult to correlate with anthropogenic sound exposure, so it is usually inferred by observed displacement from known foraging areas, the appearance of secondary indicators (*e.g.,* bubble nets or sediment plumes), or changes in dive behavior. As for other types of behavioral response, the frequency, duration, and temporal pattern of signal presentation, as well as differences in species sensitivity, are likely contributing factors to differences in response in any given circumstance (*e.g.,* Croll *et al.* 2001; Nowacek *et al.* 2004; Madsen *et al.* 2006; Yazvenko *et al.* 2007). A determination of whether foraging disruptions incur fitness consequences would require information on or estimates of the energetic requirements of the affected individuals and the relationship between prey availability, foraging effort and success, and the life history stage of the animal.

In 2016, ADOT documented observations of marine mammals during construction activities (*i.e.,* pile driving and DTH) at the Kodiak Ferry Dock (ABR 2016) in the Gulf of Alaska. In the marine mammal monitoring report for that project, 1,281 Steller sea lions were observed within the estimated Level B harassment zone during pile driving or DTH (*i.e.,* documented as potential take by Level B harassment). Of these, 19 individuals demonstrated an alert behavior, 7 were fleeing, and 19 swam away from the project site. All other animals (98 percent) were engaged in activities such as milling, foraging, or fighting and did not change their behavior. In addition, two sea lions approached within 20 m of active vibratory pile driving activities. Three harbor seals were observed within the disturbance zone during pile driving activities; none of them displayed disturbance behaviors. Fifteen killer whales and three harbor porpoise were also observed within the Level B harassment zone during pile driving. The killer whales were travelling or milling while all harbor porpoises were travelling. No signs of disturbance were noted for either of these species. Given the similarities in species, activities, and habitat, we expect similar behavioral responses of marine mammals to the ADOT's specified activity. That is, disturbance, if any, is likely to be temporary and localized (*e.g.,* small area movements). Monitoring reports from other recent pile driving and DTH projects in Alaska have observed similar behaviors, for example, the Biorka Island Dock Replacement Project (*https://www.fisheries.noaa.gov/action/incidental-take-authorization-faa-biorka-island-dock-replacement-project-sitka-ak*).

Stress responses —An animal's perception of a threat may be sufficient to trigger stress responses consisting of some combination of behavioral responses, autonomic nervous system responses, neuroendocrine responses, or immune responses (*e.g.*, Seyle 1950; Moberg 2000). In many cases, an animal's first and sometimes most economical (in terms of energetic costs) response is behavioral avoidance of the potential stressor. Autonomic nervous system responses to stress typically involve changes in heart rate, blood pressure, and gastrointestinal activity. These responses have a relatively short duration and may or may not have a significant long-term effect on an animal's fitness.

Neuroendocrine stress responses often involve the hypothalamus-pituitary-adrenal system. Virtually all neuroendocrine functions that are affected by stress—including immune competence, reproduction, metabolism, and behavior—are regulated by pituitary hormones. Stress-induced changes in the secretion of pituitary hormones have been implicated in failed reproduction, altered metabolism, reduced immune competence, and behavioral disturbance (*e.g.*, Moberg 1987; Blecha 2000). Increases in the circulation of glucocorticoids are also equated with stress (Romano *et al.* 2004).

The primary distinction between stress (which is adaptive and does not normally place an animal at risk) and "distress" is the cost of the response. During a stress response, an animal uses glycogen stores that can be quickly replenished once the stress is alleviated. In such circumstances, the cost of the stress response would not pose serious fitness consequences. However, when an animal does not have sufficient energy reserves to satisfy the energetic costs of a stress response, energy resources must be diverted from other functions. This state of distress will last until the animal replenishes its energetic reserves sufficient to restore normal function.

Relationships between these physiological mechanisms, animal behavior, and the costs of stress responses are well-studied through controlled experiments and for both laboratory and free-ranging animals (*e.g.*, Holberton *et al.* 1996; Hood *et al.* 1998; Jessop *et al.* 2003; Krausman *et al.* 2004; Lankford *et al.* 2005). Stress responses due to exposure to anthropogenic sounds or other stressors and their effects on marine mammals have also been reviewed (Fair and Becker 2000; Romano *et al.* 2002b) and, more rarely, studied in wild populations (*e.g.*, Romano *et al.* 2002a). For example, Rolland *et al.* (2012) found that noise reduction from reduced ship traffic in the Bay of Fundy was associated with decreased stress in North Atlantic right whales. These and other studies lead to a reasonable expectation that some marine mammals will experience physiological stress responses upon exposure to acoustic stressors and that it is possible that some of these would be classified as "distress." In addition, any animal experiencing TTS would likely also experience stress responses (NRC 2003), however distress is an unlikely result of this project based on observations of marine mammals during previous, similar projects in the area.

Masking—Sound can disrupt behavior through masking, or interfering with, an animal's ability to detect, recognize, or discriminate between acoustic signals of interest (*e.g.,* those used for intraspecific communication and social interactions, prey detection, predator avoidance, navigation) (Richardson *et al.* 1995). Masking occurs when the receipt of a sound is interfered with by another coincident sound at similar frequencies and at similar or higher intensity, and may occur whether the sound is natural (*e.g.,* snapping shrimp, wind, waves, precipitation) or anthropogenic (*e.g.,* pile driving, shipping, sonar, seismic exploration) in origin. The ability of a noise source to mask biologically important sounds depends on the characteristics of both the noise source and the signal of interest (*e.g.,* signal-to-noise ratio, temporal variability, direction), in relation to each other and to an animal's hearing abilities (*e.g.,* sensitivity, frequency range, critical ratios, frequency discrimination, directional discrimination, age or TTS hearing loss), and existing ambient noise and propagation conditions. Masking of natural sounds can result when human activities produce high levels of background sound at frequencies important to marine mammals. Conversely, if the background level of underwater sound is high (*e.g.,* on a day with strong wind and high waves), an anthropogenic sound source would not be detectable as far away as would be possible under quieter conditions and would itself be masked.

Airborne Acoustic Effects—Pinnipeds that occur near the project site could be exposed to airborne sounds associated with pile driving and removal and DTH that have the potential to cause behavioral harassment, depending on their distance from these activities. Cetaceans are not expected to be exposed to airborne sounds that would result in harassment as defined under the MMPA.

Airborne noise would primarily be an issue for pinnipeds that are swimming or hauled out near the project site within the range of noise levels elevated above the acoustic criteria. We recognize that pinnipeds in the water could be exposed to airborne sound that may result in behavioral harassment when looking with their heads above water. Most likely, airborne sound would cause behavioral responses similar to those discussed above in relation to underwater sound. For instance, anthropogenic sound could cause hauled-out pinnipeds to exhibit changes in their normal behavior, such as reduction in vocalizations, or cause them to temporarily abandon the area and move further from the source. However, these animals would previously have been `taken' because of exposure to underwater sound above the behavioral harassment thresholds, which are in all cases larger than those associated with airborne sound. Thus, the behavioral harassment of these animals is already accounted for in these estimates of potential take. Therefore, we do not believe that authorization of incidental take resulting from airborne sound for pinnipeds is warranted, and airborne sound is not discussed further here.

Marine Mammal Habitat Effects

ADOT's proposed activities at the project area would not result in permanent negative impacts to habitats used directly by marine mammals, but may have potential short-term impacts to food sources such as forage fish and may affect acoustic habitat (see masking discussion above). There are no known foraging hotspots or other ocean bottom structure of significant biological importance to marine mammals present in the marine waters of the project area during the construction window, but there are times of increased foraging during periods of forage fish and salmonid spawning. ADOT's construction activities in Tongass Narrows could have localized, temporary impacts on marine mammal habitat and their prey by increasing in-water sound pressure levels and slightly decreasing water quality. Increased noise levels may affect acoustic habitat (see masking discussion above) and adversely affect marine mammal prey in the vicinity of the project area (see discussion below). During DTH, impact and vibratory pile driving or removal, elevated levels of underwater noise would ensonify a portion of Tongass Narrows and nearby waters where both fishes and mammals occur and could affect foraging success. Additionally, marine mammals may avoid the area during construction, however, displacement due to noise is expected to be temporary and is not expected to result in long-term effects to the individuals or populations. Construction activities are of short duration and would likely have temporary impacts on marine mammal habitat through increases in underwater and airborne sound.

The area likely impacted by the project includes much of Tongass Narrows, but overall this area is relatively small compared to the available habitat in the surrounding area including Revillagigedo Channel, Behm Canal, and Clarence Strait. Pile installation/removal and DTH may temporarily increase turbidity resulting from suspended sediments. Any increases would be temporary, localized, and minimal. In general, turbidity associated with pile installation is localized to about a 25-ft radius around the pile (Everitt *et al.* 1980). Cetaceans are not expected to be close enough to the project pile driving areas to experience effects of turbidity, and pinnipeds could avoid localized areas of turbidity. Therefore, the impact from increased turbidity levels is expected to minimal for marine mammals. Furthermore, pile driving and removal at the project site would not obstruct movements or migration of marine mammals.

In-water Construction Effects on Potential Prey — Construction activities would produce continuous (*i.e.,* vibratory pile driving and DTH) and intermittent (*i.e.* impact driving and DTH) sounds. Sound may affect marine mammals through impacts on the abundance, behavior, or distribution of prey species (*e.g.*, crustaceans, cephalopods, fish, zooplankton). Marine mammal prey varies by species, season, and location. Here, we describe studies regarding the effects of noise on known marine mammal prey.

Fish utilize the soundscape and components of sound in their environment to perform important functions such as foraging, predator avoidance, mating, and spawning (*e.g.*, Zelick and Mann 1999; Fay 2009). Depending on their hearing anatomy and peripheral sensory structures, which vary among species, fishes hear sounds using pressure and particle motion sensitivity capabilities and detect the motion of surrounding water (Fay *et al.* 2008). The potential effects of noise on fishes depends on the overlapping frequency range, distance from the sound source, water depth of exposure, and species-specific hearing sensitivity, anatomy, and physiology. Key impacts to fishes may include behavioral responses, hearing damage, barotrauma (pressure-related injuries), and mortality.

Fish react to sounds that are especially strong and/or intermittent low-frequency sounds. Short duration, sharp sounds can cause overt or subtle changes in fish behavior and local distribution. The reaction of fish to noise depends on the physiological state of the fish, past exposures, motivation (*e.g.*, feeding, spawning, migration), and other environmental factors. Hastings and Popper (2005) identified several studies that suggest fish may relocate to avoid certain areas of sound energy. Additional studies have documented effects of pile driving on fish; several are based on studies in support of large, multiyear bridge construction projects (*e.g.,* Scholik and Yan 2001, 2002; Popper and Hastings 2009). Several studies have demonstrated that impulse sounds might affect the distribution and behavior of some fishes, potentially impacting foraging opportunities or increasing energetic costs (*e.g.*, Fewtrell and McCauley, 2012; Pearson *et al.* 1992; Skalski *et al.* 1992; Santulli *et al.* 1999; Paxton *et al.* 2017). However, some studies have shown no or slight reaction to impulse sounds (*e.g.*, Pena *et al.* 2013; Wardle *et al.* 2001; Jorgenson and Gyselman, 2009; Cott *et al.* 2012).

SPLs of sufficient strength have been known to cause injury to fish and fish mortality. However, in most fish species, hair cells in the ear continuously regenerate and loss of auditory function likely is restored when damaged cells are replaced with new cells. Halvorsen *et al.* (2012a) showed that a TTS of 4-6 dB was recoverable within 24 hours for one species. Impacts would be most severe when the individual fish is close to the source and when the duration of exposure is long. Injury caused by barotrauma can range from slight to severe and can cause death, and is most likely for fish with swim bladders. Barotrauma injuries have been documented during controlled exposure to impact pile driving (Halvorsen *et al.* 2012b; Casper *et al.* 2013).

The most likely impact to fish from pile driving and removal and DTH activities at the project area would be temporary behavioral avoidance of the area. The duration of fish avoidance of this area after pile driving stops is unknown, but a rapid return to normal recruitment, distribution and behavior is anticipated. Any behavioral avoidance by fish of the disturbed area would still leave significantly large areas of fish and marine mammal foraging habitat in the nearby vicinity in Revillagigedo Channel, Behm Canal, and Clarence Strait. Additionally, the City of Ketchikan within Tongass Narrows has a busy industrial water front, and human impact lessens the value of the area as foraging habitat. There are times of known seasonal marine mammal foraging in Tongass Narrows around fish processing/hatchery infrastructure or when fish are congregating, but the impacted areas of Tongass Narrows are a small portion of the total foraging habitat available in the region. In general, impacts to marine mammal prey species are expected to be minor and temporary due to the short timeframe of the project.

Construction activities, in the form of increased turbidity, have the potential to adversely affect eulachon, herring, and juvenile salmonid outmigratory routes in the project area. Salmon and forage fish, like eulachon and herring, form a significant prey base for Steller sea lions and are major components of the diet of many other marine mammal species that occur in the project area. Increased turbidity is expected to occur only in the immediate vicinity of construction activities and to dissipate quickly with tidal cycles. Given the limited area affected and high tidal dilution rates any effects on fish are expected to be minor.

Additionally, the presence of transient killer whales means some marine mammal species are also possible prey (harbor seals, harbor porpoises). ADOT's pile driving, pile removal and DTH activities are expected to result in limited instances of take by Level B and Level A harassment on these smaller marine mammals. That, as well as the fact that

ADOT is impacting a small portion of the total available marine mammal habitat means that there would be minimal impact on these marine mammals as prey.

In summary, given the short daily duration of sound associated with individual pile driving and DTH events and the small area being affected relative to available nearby habitat, pile driving and DTH activities associated with the proposed action are not likely to have a permanent, adverse effect on any fish habitat, or populations of fish species or other prey. Thus, we conclude that impacts of the specified activity are not likely to have more than short-term adverse effects on any prey habitat or populations of prey species. Further, any impacts to marine mammal habitat are not expected to result in significant or long-term consequences for individual marine mammals, or to contribute to adverse impacts on their populations.

Estimated Take

This section provides an estimate of the number of incidental takes proposed for authorization through this IHA, which will inform both NMFS' consideration of "small numbers" and the negligible impact determination.

Harassment is the only type of take expected to result from these activities. Except with respect to certain activities not pertinent here, section 3(18) of the MMPA defines "harassment" as any act of pursuit, torment, or annoyance, which (i) has the potential to injure a marine mammal or marine mammal stock in the wild (Level A harassment); or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering (Level B harassment).

Authorized takes would primarily be by Level B harassment, as use of the acoustic sources (*i.e.*, impact and vibratory pile driving and DTH) have the potential to result in disruption of behavioral patterns for individual marine mammals. There is also some potential for auditory injury (Level A harassment) to result, primarily for mysticetes, high frequency species and phocids because predicted auditory injury zones are larger than for mid-frequency species and otariids. Auditory injury is unlikely to occur for mid-frequency species and otariids. The proposed mitigation and monitoring measures are expected to minimize the severity of such taking to the extent practicable.

As described previously, no mortality is anticipated or proposed to be authorized for this activity. Below we describe how the take is estimated.

Generally speaking, we estimate take by considering: (1) acoustic thresholds above which NMFS believes the best available science indicates marine mammals will be behaviorally harassed or incur some degree of permanent hearing impairment; (2) the area or volume of water that will be ensonified above these levels in a day; (3) the density or occurrence of marine mammals within these ensonified areas; and, (4) and the number of days of activities. We note that while these basic factors can contribute to a basic calculation to provide an initial prediction of takes, additional information that can qualitatively inform take estimates is also sometimes available (*e.g.,* previous monitoring results or average group size). Below, we describe the factors considered here in more detail and present the proposed take estimate.

Acoustic Thresholds

NMFS recommends the use of acoustic thresholds that identify the received level of underwater sound above which exposed marine mammals would be reasonably expected to be behaviorally harassed (equated to Level B harassment) or to incur PTS of some degree (equated to Level A harassment).

Level B Harassment for non-explosive sources – Though significantly driven by received level, the onset of behavioral disturbance from anthropogenic noise exposure is also informed to varying degrees by other factors related to the source (*e.g.*, frequency, predictability, duty cycle), the environment (*e.g.*, bathymetry), and the receiving animals (hearing, motivation, experience, demography, behavioral context) and can be difficult to predict (Southall *et al.* 2007, Ellison *et al.* 2012). Based on what the available science indicates and the practical need to use a threshold based on a factor that is both predictable and measurable for most activities, NMFS uses a generalized acoustic threshold based on received level to estimate the onset of behavioral harassment. NMFS predicts that marine mammals are likely to be behaviorally harassed in a manner we consider Level B harassment when exposed to underwater anthropogenic noise above received levels of 120 dB re 1 microPascal (μPa) (root mean square (rms)) for continuous (*e.g.,* vibratory pile-driving, DTH) and above 160 dB re 1 μPa (rms) for non-explosive impulsive (*e.g.*, seismic airguns) or intermittent (*e.g.*, scientific sonar) sources. This take estimation includes disruption of behavioral patterns resulting directly in response to noise exposure (*e.g.*, avoidance), as well as that resulting indirectly from associated impacts such as TTS or masking. ADOT's proposed activity includes the use of continuous (vibratory pile driving/removal and DTH) and impulsive (impact pile driving and DTH) sources, and therefore both the 120 and 160 dB re 1 μPa (rms) thresholds are applicable.

Level A harassment for non-explosive sources - NMFS' Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (Version 2.0) (Technical Guidance, 2018) identifies dual criteria to assess auditory injury (Level A harassment) to five different marine mammal groups (based on hearing sensitivity) as a result of exposure to noise from two different types of sources (impulsive or non-impulsive). ADOT's proposed activity includes the use of impulsive (impact pile driving and DTH) and non-impulsive (vibratory pile driving/removal and DTH) sources.

These thresholds are provided in Table 4 below. The references, analysis, and methodology used in the development of the thresholds are described in NMFS 2018 Technical Guidance, which may be accessed at *https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-acoustic-technical-guidance*.

Table 4-- Thresholds Identifying the Onset of Permanent Threshold Shift

	PTS Onset Acoustic Thresholds* (Received Level)	
Hearing Group	Impulsive	Non-impulsive
Low-Frequency (LF) Cetaceans	*Cell 1* $L_{pk,flat}$: 219 dB $L_{E,LF,24h}$: 183 dB	*Cell 2* $L_{E,LF,24h}$: 199 dB
Mid-Frequency (MF) Cetaceans	*Cell 3* $L_{pk,flat}$: 230 dB $L_{E,MF,24h}$: 185 dB	*Cell 4* $L_{E,MF,24h}$: 198 dB
High-Frequency (HF) Cetaceans	*Cell 5* $L_{pk,flat}$: 202 dB $L_{E,HF,24h}$: 155 dB	*Cell 6* $L_{E,HF,24h}$: 173 dB
Phocid Pinnipeds (PW) (Underwater)	*Cell 7* $L_{pk,flat}$: 218 dB $L_{E,PW,24h}$: 185 dB	*Cell 8* $L_{E,PW,24h}$: 201 dB
Otariid Pinnipeds (OW) (Underwater)	*Cell 9* $L_{pk,flat}$: 232 dB $L_{E,OW,24h}$: 203 dB	*Cell 10* $L_{E,OW,24h}$: 219 dB

* Dual metric acoustic thresholds for impulsive sounds: Use whichever results in the largest isopleth for calculating PTS onset. If a non-impulsive sound has the potential of exceeding the peak sound pressure level thresholds associated with impulsive sounds, these thresholds should also be considered.

Note: Peak sound pressure (L_{pk}) has a reference value of 1 μPa, and cumulative sound exposure level (L_E) has a reference value of 1μPa^{2}s. In this Table, thresholds are abbreviated to reflect American National Standards Institute standards (ANSI 2013). However, peak sound pressure is defined by ANSI as incorporating frequency weighting, which is not the intent for this Technical Guidance. Hence, the subscript "flat" is being included to indicate peak sound pressure should be flat weighted or unweighted within the generalized hearing range. The subscript associated with cumulative sound exposure level thresholds indicates the designated marine mammal auditory weighting function (LF, MF, and HF cetaceans, and PW and OW pinnipeds) and that the recommended accumulation period is 24 hours. The cumulative sound exposure level thresholds could be exceeded in a multitude of ways (*i.e.*, varying exposure levels and durations, duty cycle). When possible, it is valuable for action proponents to indicate the conditions under which these acoustic thresholds will be exceeded.

Ensonified Area

Here, we describe operational and environmental parameters of the activity that will feed into identifying the area ensonified above the acoustic thresholds, which include source levels and transmission loss coefficient.

The sound field in the project area is the existing background noise plus additional construction noise from the proposed project. Marine mammals are expected to be affected via sound generated by the primary components of the project (*i.e.*, impact pile driving, vibratory pile driving, vibratory pile removal, and DTH).

In order to calculate distances to the Level A harassment and Level B harassment sound thresholds for the methods and piles being used in this project, NMFS used acoustic monitoring data from other locations to develop source levels for the various pile types, sizes and methods (Table 5). Note that piles of differing sizes have different sound source levels (SSLs).

Empirical data from recent ADOT sound source verification (SSV) studies at Ketchikan were used to estimate SSLs for vibratory and impact driving of 30-inch steel pipe piles (Denes *et al.* 2016). Data from Ketchikan was used because of its proximity to this proposed project in Tongass Narrows. However, the use of data from Alaska sites was not appropriate in all instances. Details are described below.

For vibratory driving of 24-inch steel piles, data from a Navy pile driving project in the Puget Sound, WA was reviewed (Navy 2015). From this review, ADOT determined the Navy's suggested source value of 161 dB rms was an appropriate proxy source value, and NMFS concurs. Because the source value of smaller piles of the same general type (steel in this case) are not expected to exceed a larger pile, the same 161 dB rms source value was used for 20-inch steel piles. This assumption conforms with source values presented in Navy (2015) for a project using 16-inch steel piles at Naval Base Kitsap in Bangor, WA.

ADOT used source values of 177 dB SEL and 190 dB rms for impact driving of 24-inch and 20-inch steel piles. These values were determined based on summary values presented in Caltrans (2015) for impact driving of 24-inch steel piles. NMFS concurs that the same source value was an acceptable proxy for impact driving of 20-inch steel piles.

Sound pressure levels in the water column resulting from DTH are not well studied. Because DTH hole creation includes both impulsive and continuous components, NMFS guidance currently recommends that it be treated as a continuous sound for Level B calculations and as an impulsive sound for Level A calculations (Table 11). In the absence of data specific to different hole sizes, current NMFS guidance recommends that calculation of Level B zones for DTH use the same continuous SSL of 167 dB SEL for all hole sizes (Heyvaert and Reyff 2021). Recommended SSLs for 30-inch and 24-inch holes as well as 8-inch holes for tension anchors and micropiles for use in the calculation of Level A harassment thresholds are provided by current NMFS guidance and in Table 5.

Table 5-- Estimates of Mean Underwater Sound Levels Generated During Vibratory and Impact Pile Installation, DTH, and Vibratory Pile Removal

Method and pile type	SSL at 10 m		Literature source
Vibratory hammer	dB rms		
30-inch steel piles	162		Denes *et al.* 2016
24-inch steel piles	161		Navy 2015
20-inch steel piles	161		Navy 2015
DTH of rock sockets and tension anchors	dB rms		
All pile diameters	167		Heyvaert and Reyff 2021
DTH of rock sockets and tension anchors	dB SELss	dB peak	
30-inch rock socket	164	194	Reyff and Heyvaert 2019; Reyff 2020; Denes *et al.* 2016
24-inch rock socket	159	184	Heyvaert and Reyff 2021

8-inch tension anchor/ micropile	144	170		Reyff 2020
Impact Hammer	dB rms	dB SEL	dB peak	
30-inch steel piles	195	181	209	Denes *et al.* 2016
24-inch steel piles	190	177	203	Caltrans 2015
20-inch steel piles	190	177	202	Caltrans 2015

Note: It is assumed that noise levels during pile installation and removal are similar. SEL = sound exposure level; dB peak = peak sound level; rms = root mean square.

Simultaneous use of two impact, vibratory, or DTH hammers, or any combination of those equipment, could occur. Such occurrences are anticipated to be infrequent, would be for short durations on any given day, and ADOT anticipates that no more than two hammers would be operated concurrently. Simultaneous use of two hammers or DTH systems could occur at the same project site, or at two different, but nearby project sites. Simultaneous use of hammers could result in increased SPLs and harassment zone sizes given the proximity of the component driving sites and the physical rules of decibel addition. ADOT anticipates that concurrent use of two hammers producing continuous noise could occur on 44 days, which is half the anticipated number of days of construction (91 days) and represents complete overlap between the two contracts and/or represents use of two hammers by a single contractor. Although it is unlikely that overlap would be complete, ADOT anticipates, and NMFS concurs, this scenario represents the potential worst case scenario, given that a more accurate estimate is not possible, and concurrent operation of hammers would be incidental. Given that the use of more than one hammer for pile installation on the same day (whether simultaneous or not) would increase the number of piles installed per day, this would be anticipated to result in a reduction of the total number of days of pile installation. Table 6 shows how potential scenarios would reduce the total number of pile driving days and weeks. However, as described in the *Marine Mammal Occurrence and Take Calculation and Estimation* section below, ADOT has conservatively calculated take with the assumption that pile driving would occur on all 91 days.

Table 6-- Calculated Reduction of Pile Driving Days Based on Percentage of Project Days with Two Hammers in Use

Percent Overlap	Days of Overlap	Days of Work Completed During Overlap (2 Hammers)	Remaining Days of Work With Single Hammer	Total Number of Days of Work	Weeks of Work
0	0.0	0.0	91.0	91.0	15.2
10	9.1	18.2	72.8	81.9	13.7
20	18.2	36.4	54.6	72.8	12.1
30	27.3	54.6	36.4	63.7	10.6
40	36.4	72.8	18.2	54.6	9.1
50	45.5	91.0	0.0	45.5	7.6

NMFS (2018b) handles overlapping sound fields created by the use of more than one hammer differently for impulsive (impact hammer and Level A harassment zones for drilling with a DTH hammer) and continuous sound sources (vibratory hammer and Level B harassment zones for drilling with a DTH hammer; Table 7) and differently for impulsive sources with rapid impulse rates of multiple strikes per second (DTH) and slow impulse rates (impact hammering) (NMFS 2021). It is unlikely that the two impact hammers would strike at the same instant, and therefore, the SPLs would not be adjusted regardless of the distance between impact hammers. In this case, each impact hammer would be considered to have its own independent Level A harassment and Level B harassment zones.

When two DTH hammers operate simultaneously their continuous sound components overlap completely in time. When the Level B isopleth of one DTH sound source encompasses the isopleth of another DTH sound source, the sources are considered additive and combined using the following rules (Table 7). The method described below was based on one created by Washington State Department of

Transportation (WSDOT) and has been updated and modified by NMFS (WSDOT 2020). For addition of two simultaneous DTH hammers, the difference between the two SSLs is calculated, and if that difference is between 0 and 1 dB, 3 dB are added to the higher SSL; if difference is between 2 or 3 dB, 2 dB are added to the highest SSL; if the difference is between 4 to 9 dB, 1 dB is added to the highest SSL; and with differences of 10 or more decibels, there is no addition.

When two continuous noise sources, such as vibratory hammers, have overlapping sound fields, there is potential for higher sound levels than for non-overlapping sources.

When two or more vibratory hammers are used simultaneously, and the isopleth of one sound source encompasses the isopleth of another sound source, the sources are considered additive and source levels are combined using the rules in Table 7, similar to described above for DTH.

Table 7-- Rules for Combining Sound Source Levels Generated During Pile Installation

Hammer Types	Difference in SSL	Level A Zones	Level B Zones
Vibratory, Impact	Any	Use impact zones	Use largest zone
Impact, Impact	Any	Use zones for each pile size and number of strikes	Use zone for each pile size
Vibratory, Vibratory or DTH, DTH	0 or 1 dB	Add 3 dB to the higher source level	Add 3 dB to the higher source level
	2 or 3 dB	Add 2 dB to the higher source level	Add 2 dB to the higher source level
	4 to 9 dB	Add 1 dB to the higher source level	Add 1 dB to the higher source level
	10 dB or more	Add 0 dB to the higher source level	Add 0 dB to the higher source level

During pile driving, it is common for pile installation to start and stop multiple times as each pile is adjusted and its progress is measured and documented, though as stated above, for short durations, it is anticipated that multiple hammers could be in use simultaneously. Following an approach modified from WSDOT in their Biological Assessment manual (WSDOT 2020) and described in Table 8, decibel addition calculations were carried out for possible combinations of pile driving and DTH throughout the project area. The source levels included in Table 8 are used to estimate the Level A harassment zones and the Level B harassment zones.

Table 8--Combined SSLs (dB at 10 m) Generated During Pile Installation and Removal for Combinations of Two Pieces of Equipment: Impact Hammer, Vibratory Hammer, and Down-the-Hole Drill

Method			Vibratory (RMS)			DTH (RMS)			DTH (SEL)		
	Pile Diameter		20	24	30	8	24	30	8	24	30
		SSL	161	161	162	167	167	167	144	159	164
Vibratory (RMS)	20	161	164	164	165	168	168	168			
	24	161	164	164	165	168	168	168			
	30	162	165	165	165	168	168	168			
DTH (RMS)	8	167	168	168	168	170	170	170			
	24	167	168	168	168	170	170	170			
	30	167	168	168	168	170	170	170			
DTH (SEL)	8	144							147	159	164
	24	159							159	162	165
	30	164							164	165	167

No addition is warranted for impact pile driving in combination with vibratory or impact pile driving or DTH (NMFS 2021).

Level B Harassment Zones

Transmission loss (TL) is the decrease in acoustic intensity as an acoustic pressure wave propagates out from a source. TL parameters vary with frequency, temperature, sea conditions, current, source and receiver depth, water depth, water chemistry, and bottom composition and topography. The general formula for underwater TL is:

$TL = B * Log10 (R1/R2)$,

Where:

TL = transmission loss in dB

B = transmission loss coefficient; for practical spreading equals 15

R1 = the distance of the modeled SPL from the driven pile, and

R2 = the distance from the driven pile of the initial measurement

The recommended TL coefficient for most nearshore environments is the practical spreading value of 15. This value results in an expected propagation environment that would lie between spherical and cylindrical spreading loss conditions, which is the most appropriate assumption for ADOT's proposed activity in the absence of specific modelling.

All Level B harassment isopleths are reported in Table 9 and Table 10 below. It should be noted that based on the geography of Tongass Narrows and the surrounding islands, sound would not reach the full distance of the Level B harassment isopleth in most directions. Generally, due to interaction with land, only a thin slice of the possible area is ensonified to the full distance of the Level B harassment isopleth.

The size of the Level B harassment zone during concurrent operation of two vibratory or DTH hammers would depend on the combination of sound sources and the decibel addition of two hammers producing continuous noise. Table 9 shows the distances to Level B harassment isopleths during simultaneous hammering from two sources, based on the combined SSL. Because the calculated Level B harassment isopleths for two sources are dependent upon the combined SSL, the Level B harassment zone for each combined sound source level included in Table 9 is consistent, regardless of the equipment combination. Please refer to Table 8 to determine which sound sources apply to each Combined SSL.

As noted previously, pile installation often involves numerous stops and starts of the hammer for each pile. Therefore, decibel addition is applied only when the adjacent continuous sound sources experience overlapping sound fields, which generally requires close proximity of driving locations.

Table 9-- Level B Harassment Isopleths for Multiple Vibratory Hammer Additions

Combined SSL (dB)	Level B Harassment Isopleth (m)[a]
164	8,577
165	10,000
166	11,659
167	13,594
168	15,849
169	18,478
170	21,544

[a] These larger zones are truncated to the southeast by islands, which prevent propagation of sound in that direction beyond the confines of Tongass Narrows. To the northwest of Tongass Narrows, combined sound levels that exceed 167 dB rms extend into Clarence Strait before attenuating to sound levels that are anticipated to be below 120 dB rms.

Table 10-- Level B Harassment Isopleths for Single Hammer Use by Activity and Pile Size

<table>
<tr><th>Activity</th><th>Pile Diameter</th><th>Level B Harassment Isopleth (m)</th></tr>
<tr><td rowspan="3">Vibratory Installation</td><td>30-inch</td><td>6,310</td></tr>
<tr><td>24-inch</td><td rowspan="3">5,412</td></tr>
<tr><td>20-inch</td></tr>
<tr><td>Vibratory Removal</td><td>24-inch</td></tr>
<tr><td rowspan="2">DTH Rock Sockets</td><td>30-inch</td><td rowspan="3">13,594</td></tr>
<tr><td>24-inch</td></tr>
<tr><td>DTH Tension Anchor/ Micropile</td><td>8-inch</td></tr>
<tr><td rowspan="3">Impact Installation</td><td>30-inch</td><td>2,154</td></tr>
<tr><td>24-inch</td><td>1,000</td></tr>
<tr><td>20-inch</td><td>1,000</td></tr>
</table>

Level A Harassment Zones

When the NMFS Technical Guidance (2016) was published, in recognition of the fact that ensonified area/volume could be more technically challenging to predict because of the duration component in the new thresholds, we developed a User Spreadsheet that includes tools to help predict a simple isopleth that can be used in conjunction with marine mammal density or occurrence to help predict takes. We note that because of some of the assumptions included in the methods used for these tools, we anticipate that isopleths produced are typically going to be overestimates of some degree, which may result in some degree of overestimate of takes by Level A harassment. However, these tools offer the best way to predict appropriate isopleths when more sophisticated 3D modeling methods are not available, and NMFS continues to develop ways to quantitatively refine these tools, and will qualitatively address the output where appropriate. For stationary sources such as pile driving or removal and DTH using any of the methods discussed above, NMFS User Spreadsheet predicts the closest distance at which, if a marine mammal remained at that distance the whole duration of the activity, it would incur PTS. Inputs used in the User Spreadsheet are reported in Table 11 and Table 12, and the resulting isopleths are reported below in Table 13 and Table 14. Pile installation and removal can occur at variable rates, from a few minutes one day to many hours the next. ADOT anticipates that one permanent pile would be installed per day on 27 non-consecutive days, two temporary piles would be installed per day on 10 non-consecutive days, and two temporary piles would be removed per day on 10 days.

Table 11-- NMFS User Spreadsheet Inputs For Single Hammer Use

Equipment Type	Vibratory Pile Driver (Installation of 30-inch steel piles)	Vibratory Pile Driver (Installation and Removal of 24-inch steel piles)	Vibratory Pile Driver (Installation of 20-inch steel piles)	DTH Rock Sockets (30-inch)	DTH Rock Sockets (24-inch)	DTH Tension Anchor (8-inch)	Impact Pile Driver (30-inch steel piles)	Impact Pile Driver (24-inch steel piles)	Impact Pile Driver (20-inch steel piles)
Spreadsheet Tab Used	A.1) Vibratory Pile Driving	A.1) Vibratory Pile Driving	A.1) Vibratory Pile Driving	E.2) DTH Pile Driving	E.2) DTH Pile Driving	E.2) DTH Pile Driving	E.1) Impact Pile Driving	E.1) Impact Pile Driving	E.1) Impact Pile Driving
Weighting Factor Adjustment (kHz)	2.5	2.5	2.5	2	2	2	2	2	2
SSL	162[a]	161[a]	161[a]	164[b]	159[b]	144[b]	181[b]	177[b]	177[b]
Activity duration (hours) within 24 hours	1	1	1	1 – 10	1 – 10	2-4			
Number of piles per day	1	1	1	1	1	1	1	1	1
Strike rate strikes per second				15	15	25.83			
Number of strikes per pile							50	50	50

Propagation loss coefficient in all cases is 15.

* Duration estimates for DTH are based on assumption of multiple rock sockets and tension anchors being installed each day, with the maximum duration time for installation per day predicted to be 10 hours for rock socket DTH and 4 hours for tension anchor DTH.

** For specifics regarding the number of strikes and number of piles would be used in a given situation, please refer to Table 1.

[a] dB rms at 10m

[b] dB SEL at 10m

Regarding implications for Level A harassment zones when two vibratory hammers are operating concurrently, given the small size of the estimated Level A harassment isopleths for all hearing groups during vibratory pile driving, the zone of any two hammers would not be expected to overlap. Therefore, compounding effects of multiple vibratory hammers operating concurrently are not anticipated, and NMFS has treated each source independently.

Regarding implications for Level A harassment zones when one vibratory hammer and one DTH hammer are operating concurrently, combining isopleths for these sources is difficult for a variety of reasons. First, vibratory pile driving relies upon non-impulsive PTS thresholds, while DTH/rock hammers use impulsive thresholds. Second, vibratory pile driving account for the duration to drive a pile, while DTH account for strikes per pile. Thus, it is difficult to measure sound on the same scale and combine isopleths from these impulsive and non-impulsive, continuous sources. Therefore, NMFS has treated each source independently at this time.

Regarding the operation of two DTH hammers concurrently, since DTH hammers are capable of multiple strikes per second, there is potential for multiple DTH/rock hammer sources' isopleths to overlap in space and time (a higher strike rate indicates a greater potential for overlap). Therefore, NMFS has calculated distances to Level A harassment isopleths, by hearing group for simultaneous use of two DTH hammers (Table 14), using NMFS' User Spreadsheet. The inputs for these calculations are outlined in Table 12. When the Level A isopleth of one DTH sound source encompasses the isopleth of another DTH sound source, the sources are considered additive and combined using the rules in Table 7 as described above. The number of piles per day is altered to reflect only a single pile for all those that overlap in space and time (*i.e.*, no double counting of overlapping piles). The maximum strike rate and duration of the two DTH systems is used in the User Spreadsheet calculations.

Table 12-- NMFS User Spreadsheet Inputs for Simultaneous Use of Two DTH Hammers

Spreadsheet Tab Used		E.2) DTH Pile Driving
Weighting Factor Adjustment (kHz)		2
SSL(dB SEL at 10m)[a]	8-in pile/ 8-in pile	147
	8-in pile, 24-in pile	159
	8-in pile, 30-in pile	164
	24-in pile, 24-in pile	162
	24-in pile, 30-in pile	165
	30-in pile, 30-in pile	167
Activity duration (minutes) within 24 hours[b]		240
Number of piles per day[b]		1
Strike rate (strikes per second)		15 or 25.83[c]

[a] SSL reflects the combined SSLs calculated in Table 8
[b] ADOT anticipates that DTH could occur at one site for up to 10 hours (600 minutes) per day, and overlap between two sites could occur for up to 4 hours (240 minutes) per day. Since the potential overlap in sources is accounted for in the SSL adjustment, and the total potential duration (even with two hammers) is accounted for in the "Activity duration (minutes) within 24 hours," the "Number of piles per day" is assumed to be 1.
[c] 25.83 for combinations that include 8-in piles. 15 for all other combinations.

Level A harassment thresholds for impulsive sound sources (impact pile driving and DTH) are defined for both SELcum and Peak SPL with the threshold that results in the largest modeled isopleth for each marine mammal hearing group used to establish the Level A harassment isopleth. In this project, Level A harassment isopleths based on SELcum were always larger than those based on Peak SPL (for both single hammer use and simultaneous use of two hammers). It should be noted that there is a duration component when calculating the Level A harassment isopleth based on SELcum, and this duration depends on the number of piles that would be driven in a day and strikes per pile. For some activities, ADOT has proposed to drive variable numbers of piles per day throughout the project (See "Average Piles per Day (Range)" in Table 1), and determine at the beginning of each pile driving day, the maximum number or duration piles would be driven that day. Here, this flexibility has been accounted for by modeling multiple durations for the activity, and determining the relevant isopleths.

Table 13-- Distances to Level A Harassment Isopleths, by Hearing Group, and Area of Level A Harassment Zones, For Single Hammer Use During Pile Installation and Removal

Activity	Pile diameter(s)	Minutes per pile or strikes per pile	Level A harassment Isopleth (m)					Level A harassment areas (km^2) all hearing groups[a]
			LF	MF	HF	PW	OW	
Vibratory Installation	30-inch	60 minutes	8	1	12	5	1	< 0.1
	24-inch[b]	60 minutes	7	1	11	5	1	< 0.1
	20-inch	60 minutes	7	1	11	5	1	< 0.1
Vibratory Removal	24-inch	60 minutes	7	1	11	5	1	< 0.1
DTH Rock Sockets	30-inch	60 minutes	773	28	920	414	31	< 0.9
		300 minutes	2,258	81	2,690	1,209	88	< 3.5
		600 minutes	3,584	128	4,269	1,918	140	< 6.6
	24-inch	60 minutes	359	13	427	192	15	< 0.2
		300 minutes	1,048	38	1,249	561	41	< 1.4
		600 minutes	1,664	60	1,982	891	65	< 2.4
DTH Tension Anchor	8-inch	120 minutes	82	3	98	44	4	< 0.1
		240 minutes	130	5	155	70	6	< 0.1
Impact Installation	30-inch	50 strikes	100	4	119	54	4	< 0.1
	24-inch	50 strikes	54	2	65	29	3	< 0.1
	20-inch	50 strikes	54	2	65	29	3	< 0.1

[a] Please refer to Table 6-4 of ADOT's IHA application for hearing group-specific areas.
[b] Includes vibratory installation and removal.

Table 14-- Distances to Level A Harassment Isopleths, by Hearing Group for Simultaneous Use of Two DTH Hammers

Activity Combination	Level A Harassment Isopleth (m)				
	LF	MF	HF	PW	OW
8-in pile, 8-in pile	206	7	245	110	8
8-in pile, 24-in pile	1,297	46	1,545	694	51
8-in pile, 30-in pile	2,796	99	3,329	1,496	109
24-in pile, 24-in pile	1,431	51	1,705	766	56
24-in pile, 30-in	2,268	81	2,702	1,214	88
30-in pile, 30-in pile	3,084	110	3,673	1,650	120

Regarding implications for impact hammers used in combination with a vibratory hammer or DTH drill, the likelihood of these multiple sources' isopleths to completely overlap in time is slim primarily because impact pile driving is intermittent. Furthermore, non-impulsive, continuous sources rely upon non-impulsive TTS/PTS thresholds, while impact pile driving uses impulsive thresholds, making it difficult to calculate isopleths that may overlap from impact driving and the simultaneous action of a non-impulsive continuous source or one with multiple strikes per second. Thus, with such slim potential for multiple different sources' isopleths to overlap in space and time, specifications should be entered as "normal" into the User Spreadsheet for each individual source separately.

Marine Mammal Occurrence and Take Calculation and Estimation

In this section we provide the information about the presence, density, or group dynamics of marine mammals that will inform the take calculations. Additionally, we describe how the occurrence information is brought together to produce a quantitative take estimate for each phase. A summary of proposed take, including as a percentage of population for each of the species, is shown in Table 15.

Steller Sea Lion

Steller sea lion abundance in the Tongass Narrows area is not well known. No systematic studies of Steller sea lions have been conducted in or near the Tongass Narrows area. Steller sea lions are known to occur year-round and local residents report observing Steller sea lions approximately once or twice per week (based on communication outlined in Section 6 of ADOT's IHA application). Abundance appears to increase during herring runs (March to May) and salmon runs (July to September). Group sizes may reach up to 6 to 10 individuals (Freitag 2017 as cited in 83 FR 37473; August 1, 2018), though groups of up to 80 individuals have been observed (HDR, Inc. 2003).

ADOT conservatively estimates that one group of 10 Steller sea lions may be present in the project area each day, but this occurrence rate may as much as double (20 Steller sea lions per day) during periods of increased abundance associated with the herring and salmon runs (March to May and July to September). Therefore, ADOT anticipates that two large groups (20 individuals) may be taken by Level B harassment each day during these months. To be conservative, we assume all 91 days of work could be completed during these months of increased abundance and thus estimate 1,820 potential takes by Level B harassment of Steller sea lions in Tongass Narrows (*i.e.*, 2 groups of 10 sea lions per day × 91 construction days = 1,820 takes by Level B harassment; Table 15).

ADOT estimates that simultaneous use of two hammers (any combination) could occur on up to 44 days during the project. On those days, Level B harassment zones would extend into Clarence Strait. Steller sea lions are known to swim across Clarence Strait and to use offshore areas with deeper waters, although no estimates of at-sea density or abundance in Clarence Strait are available. Therefore, ADOT has conservatively estimated, and NMFS concurs, that during the 44 days with potential simultaneous use of two hammers, a group of 10 Steller sea lions may occur in the portion of the Level B harassment zone in Clarence Strait each day (one group of 10 sea lions per day x 44 days = 440 individuals). Therefore, the preliminary sum of estimated takes by Level B harassment of Steller sea lions between Tongass Narrows and Clarence Strait is 2,260 (1,820 + 440 = 2,260 takes by Level B harassment).

The largest Level A harassment zone for otariid pinnipeds could extend 140 m from the noise source for 10 hours of DTH using a single hammer, or 120m from the noise source for 4 hours of DTH using two hammers for 30-in piles simultaneously. (As noted previously, ADOT estimates that simultaneous use of any two hammer types would occur on no more than 44 days). Zones for shorter durations and other activities would be smaller (Table 13). For some DTH activities, the estimated Level A harassment zone is larger than the proposed shutdown zone, and therefore, some Level A harassment could occur. Further, while unlikely, it is possible that a Steller sea lion could enter a shutdown zone without detection given the various obstructions along the shoreline, and remain in the zone long enough to be taken by Level A harassment before being observed and a shutdown occurring. ADOT therefore requests, and NMFS proposes to authorize, one take by Level A harassment on each of the 91 construction days (91 takes by Level A harassment). Take by Level B harassment proposed for authorization was calculated as the total calculated Steller sea lion takes by Level B harassment minus the takes by Level A harassment (2,260 takes – 91 takes by Level A harassment) for a total of 2,169 takes by Level B harassment. Therefore, ADOT requests, and NMFS proposes to authorize, 91 takes of Steller sea lion by Level A harassment and 2,169 takes of Steller sea lion by Level B harassment (2,260 total takes of Steller sea lion; Table 15).

Harbor Seal

Harbor seal densities in the Tongass Narrows area are not well known. No systematic studies of harbor seals have been conducted in or near Tongass Narrows. They are known to occur year-round with little seasonal variation in abundance (Freitag 2017 as cited in 83 FR 37473; August 1, 2018) and local experts estimate that there are about 1 to 3 harbor seals in Tongass Narrows every day, in addition to those that congregate near the seafood processing plants and fish hatcheries. NMFS has indicated that the maximum group size in Tongass Narrows is three individuals (83 FR 22009; May 11, 2018); however, ADOT monitoring in March 2021 observed several groups of up to 5 individuals. Based on this knowledge, the expected maximum group size in Tongass Narrows is five individuals. Harbor seals are known to be curious and may approach novel activity. For these reasons ADOT conservatively estimates that up to two groups of 5 harbor seals per group could be taken by Level B harassment due to project-related underwater noise each construction day for a total of 910 takes by Level B harassment of harbor seal in Tongass Narrows (*i.e.*, 2 groups of 5 harbor seals per day × 91 construction days = 910 total takes by Level B harassment of harbor seal; Table 15).

As noted above, ADOT estimates that simultaneous use of two hammers (any combination) could occur on up to 44 days during the project. On those days, Level B harassment zones would extend into Clarence Strait. Harbor seals are known to swim across Clarence Strait, although no estimates of at-sea density or abundance in Clarence Strait are available. It is likely that harbor seal abundance in Clarence Strait is lower than in Tongass Narrows, as harbor seals generally prefer nearshore waters. Therefore, ADOT has conservatively estimated, and NMFS concurs, that during the 44 days with potential simultaneous use of two hammers, a group of 5 harbor seals may occur in the portion of the Level B harassment zone in Clarence Strait each day (one group of 5 harbor seals per day x 44 days = 220 individuals). Therefore, the sum of total estimated takes by Level B harassment of harbor seals between Tongass Narrows and Clarence Strait is 1,130 (910 + 220 = 1,130 takes by Level B harassment).

The largest Level A harassment zone for harbor seals could extend 1,918 m from the noise source for 10 hours of DTH using a single hammer, or 1,640 m from the noise source for 4 hours of DTH using two hammers for 30-in piles simultaneously. (As noted previously, ADOT estimates that simultaneous use of any two hammer types would occur on no more than 44 days). Zones for shorter durations and other activities would be smaller (Table 13). Due to practicability concerns, NMFS proposes to require a 200 m shutdown zone for harbor seals during 24-in and 30-in DTH activities (Table 16). Therefore, for some DTH activities, the estimated Level A harassment zone is larger than the proposed shutdown zone, and therefore, some Level A harassment could occur. Harbor seals may enter and remain within the area between the Level A harassment zone and the shutdown zone for a duration long enough to be taken by Level A harassment.

Additionally, while unlikely, it is possible that a harbor seal could enter a shutdown zone without detection given the various obstructions along the shoreline, and remain in the zone for a duration long enough to be taken by Level A harassment before being observed and a shutdown occurring.

To calculate take by Level A harassment, ADOT first calculated the ratio of the maximum Level A harassment isopleth for 30-in DTH using a single hammer minus the shutdown zone isopleth (1,918 m - 200 m shutdown zone = 1,718 m) to the Level B harassment zone isopleth (13,594 m; 1,718 m/13,594 m = 0.1264). ADOT multiplied the resulting ratio by the total potential take in Tongass Narrows, resulting in 116 takes by Level A harassment (*i.e.*, 910 takes by Level B harassment x 0.1264 = 116 takes by Level A harassment). NMFS reviewed, and concurs with and adopts this method. (Potential operation of two DTH hammers for 24-in/30-in or 30-in/30-in pile combinations would result in larger Level A harassment isopleths than 1,918 m, however, such concurrent work would rarely occur, if at all, and therefore, NMFS expects that calculating Level A harassment take using those zones would be overly conservative and unrealistic. Moreover, since the method used above assumes 30-inch DTH on all days it provided a precautionary cushion since activities with smaller Level A harassment zone sizes will occur on many days.) Take by Level B harassment proposed for authorization was calculated as the total calculated harbor seal takes by Level B harassment minus the takes by Level A harassment (1,130 takes- 116 takes by Level A harassment) for a total of 1,014 takes by Level B harassment. ADOT therefore requests, and NMFS proposes to authorize, 116 takes of harbor seal by Level A harassment and 1,014 takes of harbor seal by Level B harassment (1,130 total takes of harbor seal, Table 15).

Harbor Porpoise

Harbor porpoises are non-migratory; therefore, our occurrence estimates are not dependent on season. Freitag (2017 as cited in 83 FR 37473; August 1, 2018) observed harbor porpoises in Tongass Narrows zero to one time per month. Harbor porpoises observed in the project vicinity typically occur in groups of one to five animals with an estimated maximum group size of eight animals (83 FR 37473, August 1, 2018, Solstice 2018). ADOT's 2020 and 2021 monitoring program in Tongass Narrows did not result in sightings of this species; however, ADOT assumes an occurrence rate of one group per month in the following take estimations. For our analysis, we are considering a group to consist of five animals. Based on Freitag (2017), and supported by the reports of knowledgeable locals as described in ADOT's application, ADOT estimates that one group of five harbor porpoises could enter Tongass Narrows and potentially taken by Level B harassment due to project-related noise each month for a total of 15 potential harbor porpoise takes by Level B harassment in Tongass Narrows (*i.e.*, 1 group of 5 individuals x 3 months (91 days) = 15 harbor porpoises).

As noted above, ADOT estimates that simultaneous use of two hammers (any combination) could occur on up to 44 days during the project. On those days, the Level B harassment zone would extend into Clarence Strait. Harbor porpoises are known to swim across Clarence Strait and to use other areas of deep, open waters. Dahlheim *et al.* (2015) estimated a density of 0.02 harbor porpoises/km^2 in an area that encompasses Clarence Strait. ADOT estimates, and NMFS concurs that during the 44 days with potential simultaneous use of two hammers, 17 harbor porpoises (0.02 harbor porpoises/km^2 x 18.5 km^2 x 44 days = 17 harbor porpoises) may occur in the portion of the Level B harassment zone in Clarence Strait during the project (though ADOT and NMFS anticipate that this is a conservative estimate, given the entire 18.5 km^2 area would rarely be ensonified above the Level B harassment threshold). Therefore, the sum of total estimated takes by Level B harassment of harbor porpoise between Tongass Narrows and Clarence Strait is 32 (15 + 17 = 32 takes by Level B harassment).

The largest Level A harassment zone for harbor porpoises extends 4,269 m from the noise source for 10 hours of DTH using a single hammer, and 3,673 m from the noise source for 4 hours of DTH using two hammers for 30-in piles simultaneously. (As noted previously, ADOT estimates that simultaneous use of any two hammer types would occur on no more than 44 days). Zones for shorter durations and other activities would be smaller (Table 13). Due to practicability concerns, NMFS proposes to require a 500 m shutdown zone for high frequency cetaceans during 24-in and 30-in DTH activities. Therefore, for some DTH activities, the estimated Level A harassment zone is larger than the proposed shutdown zone, and therefore, some Level A harassment could occur. Harbor porpoises may enter and remain within the area between the Level A harassment zone and the shutdown zone for a duration long enough to be taken by Level A harassment. Additionally, given the large size of required shutdown zones for some activities and the cryptic nature of harbor porpoises, it is possible that a harbor porpoise could enter a shutdown zone without detection and remain in the zone for a duration long enough to be taken by Level A harassment before being observed and a shutdown occurring.

To calculate take by Level A harassment, ADOT first calculated the ratio of the maximum Level A harassment isopleth for 30-in DTH using a single hammer minus the shutdown zone isopleth (4,269 m – 500 m =3,769 m) to the Level B harassment zone isopleth (13,594 m; 3,769/13,594 = 0.2773). ADOT multiplied the resulting ratio by the total potential take in Tongass Narrows, resulting in 5 takes by Level A harassment (*i.e.*, 15 takes by Level B harassment x 0.2773 = 5 takes by Level A harassment). NMFS reviewed and concurs with this method. (Potential operation of two DTH hammers for 24-in/30-in or 30-in/30-in pile combinations would result in larger Level A harassment isopleths than 4,269 m, however, such concurrent work would rarely occur, if at all, and therefore, as described above, NMFS expects that calculating Level A harassment take using those zones is unnecessary.) Take by Level B harassment proposed for authorization was calculated as the total calculated harbor porpoise takes by Level B harassment minus the takes by Level A harassment (32 takes – 5 takes by Level A harassment) for a total of 27 takes by Level B harassment. ADOT therefore requests and NMFS proposes to authorize 5 takes by Level A harassment and 27 takes by Level B harassment (32 total takes of harbor porpoise, Table 15).

Dall's Porpoise

Dall's porpoises are expected to only occur in the project area a few times per year. Their relative rarity is supported by Jefferson *et al.*' s (2019) presentation of historical survey data showing very few sightings in the Ketchikan area and conclusion that Dall's porpoise generally are rare in narrow waterways, like the Tongass Narrows. ADOT's monitoring program from 2020 and 2021 recorded one sighting of 6 individuals over 23 days of observation, 16 days of observations with no sightings, and two sightings of 10 individuals in 14 days of observation; this equates to one sighting every approximately 17 days (DOT&PF 2020, 2021a, 2021b, 2021c, 2021d) or approximately two sightings per month. This species is non-migratory; therefore, the occurrence estimates are not dependent on season. ADOT anticipates that one large Dall's porpoise pod (12 individuals) may be present in the project area and exposed to project related underwater noise twice each month during 3 months of construction (91 days rounded to 3 months) for a total of 72 potential takes by Level B harassment in Tongass Narrows (*i.e.,* 2 groups of 12 Dall's porpoises per month x 3 months = 72 potential takes by Level B harassment).

As noted above, ADOT estimates that simultaneous use of two hammers (any combination) could occur on up to 44 days during the project. On those days, the Level B harassment zone would extend into Clarence Strait, where Dall's porpoises are known to occur. Jefferson *et al.* (2019) estimated an average density of 0.19 Dall's porpoises/km^2

in Southeast Alaska. ADOT estimates, and NMFS concurs, that during the 44 days with potential simultaneous use of two hammers, 155 Dall's porpoises (0.19 Dall's porpoises/km^2 x 18.5 km^2 x 44 days = 155 Dall's porpoises) may occur in the portion of the Level B harassment zone in Clarence Strait during the project (though ADOT and NMFS anticipate that this is a conservative estimate, given the entire 18.5 km^2 area would rarely be ensonified above the Level B harassment threshold). Therefore, the sum of total estimated takes by Level B harassment of harbor porpoise between Tongass Narrows and Clarence Strait is 227 (72 + 155= 227 takes by Level B harassment).

The largest Level A harassment zone for Dall's porpoises extends 4,269 m from the noise source for 10 hours of DTH using a single hammer, and m from the noise source for 4 hours of DTH using two hammers for 30-in piles simultaneously. (As noted previously, ADOT estimates that simultaneous use of any two hammer types would occur on no more than 44 days). Zones for shorter durations and other activities would be smaller (Table 13). Due to practicability concerns, NMFS proposes to require a 500 m shutdown zone for high frequency cetaceans during 24-in and 30-in DTH activities. Therefore, for some DTH activities, the estimated Level A harassment zone is larger than the proposed shutdown zone, and therefore, some Level A harassment could occur. Dall's porpoises may enter and remain within the area between the Level A harassment zone and the shutdown zone and be exposed to sound levels for a duration long enough to be taken by Level A harassment. Additionally, given the large size of the required shutdown zones for some activities, it is possible that a Dall's porpoise could enter a shutdown zone without detection and remain in the zone for a duration long enough to taken by Level A harassment before being observed and a shutdown occurring.

To calculate take by Level A harassment, ADOT first calculated the ratio of the maximum Level A harassment isopleth for 30-in DTH using a single hammer minus the shutdown zone isopleth (4,269 m – 500 m =3,769 m) to the Level B harassment zone isopleth (13,594 m; 3,769/13,594 = 0.2773). ADOT multiplied the resulting ratio by the total potential take in Tongass Narrows, resulting in 20 takes by Level A harassment (*i.e.*, 72 takes by Level B harassment x 0.2773 = 20 takes by Level A harassment). NMFS revised and concurs with this method. (Potential operation of two DTH hammers for 24-in/30-in or 30-in/30-in pile combinations would result in larger Level A harassment isopleths than 4,269 m, however, such concurrent work would rarely occur, if at all, and therefore, as described above, NMFS expects that calculating Level A harassment take using those zones is unnecessary.) Take by Level B harassment proposed for authorization was calculated as the total calculated Dall's porpoise takes by Level B harassment minus the takes by Level A harassment (227 takes – 20 takes by Level A harassment) for a total of 207 takes by Level B harassment. ADOT therefore requests and NMFS proposes to authorize 20 takes by Level A harassment, and 207 takes by Level B harassment (227 total takes of Dall's porpoise, Table 15).

Pacific White-Sided Dolphin

Pacific white-sided dolphins do not generally occur in the shallow, inland waterways of Southeast Alaska. There are no records of this species occurring in Tongass Narrows, and it is uncommon for individuals to occur in the proposed project area. However, historical sightings in nearby areas (Dahlheim and Towell 1994; Muto *et al.* 2018) and recent fluctuations in distribution and abundance mean it is possible the species could be present.

To account for the possibility that this species could be present in the project area, ADOT conservatively estimates, and NMFS concurs, that one large group (92 individuals) of Pacific white-sided dolphins may be taken by Level B harassment in Tongass Narrows during the proposed activity.

As noted above, ADOT estimates that simultaneous use of two hammers (any combination) could occur on up to 44 days during the project. On those days, the Level B harassment zone would extend into Clarence Strait. However, no additional takes of Pacific white-sided dolphin are anticipated to occur due to simultaneous use of two hammers, given that Pacific white-sided dolphins are uncommon in the project area. Therefore, NMFS is proposing to authorize 92 takes by Level B harassment of Pacific white-sided dolphins.

ADOT did not request, nor does NMFS propose to authorize take by Level A harassment for this activity given that Pacific white-sided dolphins are uncommon in the project area. Further, considering the small Level A harassment zones for mid-frequency cetaceans (Table 13 and Table 14) in comparison to the required shutdown zones, it is unlikely that a Pacific white-sided dolphin would enter and remain within the area between the Level A harassment zone and the shutdown zone for a duration long enough to be taken by Level A harassment.

Killer Whale

Killer whales are observed in Tongass Narrows irregularly with peaks in abundance between May and July. During 7 months of intermittent marine mammal monitoring (October 2020–February 2021; May–June 2021), there were five killer whale sightings in 4 months (November, February, May, June) totaling 22 animals; sightings occurred on 5 out of 88 days of monitoring (DOT&PF 2020, 2021a, 2021b, 2021c, 2021d). Pod sizes ranged from two to eight animals (DOT&PF 2020, 2021a, 2021b, 2021c, 2021d). Previous incidental take authorizations in the Ketchikan area have estimated killer whale occurrence in Tongass Narrows at one pod per month, except during the peak period of May to July when estimates have included two pods per month (Freitag 2017 as cited in 83 FR 37473; August 1, 2018 and 83 FR 34134; July 17, 2019).

As noted above, ADOT estimates that simultaneous use of two hammers (any combination) could occur on up to 44 days during the project. On those days, the Level B harassment zone would extend into Clarence Strait. In estimating take by Level B harassment, ADOT assumed a pod size of 12 killer whales, that all 91 days of work would occur between May and July during the peaks in abundance, and that therefore, 2 pods may occur within the Level B harassment zone (including both Tongass Narrows and Clarence Strait) during each month of work, for a total of 72 takes by Level B harassment (2 groups x 12 individuals x 3 months =72 killer whales). Therefore, ADOT estimates that a total of 72 killer whales may be taken by Level B harassment (*i.e.*, 2 pods of 12 individuals per month x 3 months (91 days) = 72 takes by Level B harassment). NMFS reviewed and concurs with this method, and proposes to authorize 72 takes by Level B harassment of killer whale.

ADOT did not request, nor does NMFS propose to authorize take by Level A harassment of killer whales for this activity. Considering the small Level A harassment zones for mid-frequency cetaceans (Table 13 and Table 14) in comparison to the required shutdown zones, it is unlikely that a killer whale would enter and remain within the area between the Level A harassment zone and the shutdown zone for a duration long enough to be taken by Level A harassment.

Humpback Whale

As discussed in the **Description of Marine Mammals in the Area of Specified Activities** section, locals have observed humpback whales an average of about once per week in Tongass Narrows, but there is evidence to suggest occurrence may be higher during some periods of the year. The December 19, 2019 Biological Opinion stated that based on observations by local experts, approximately one group of two individuals would occur in Tongass Narrows during ADOT's activity two times per seven days during pile driving, pile removal, and DTH activities throughout the year. The assumption was based on differences in abundance throughout the year, recent observations of larger groups of whales present during summer, and a higher than average frequency of occurrence in recent months (NMFS 2019). ADOT's 2020 and

2021 monitoring program documented a similar sighting rate, with 30 humpback whale sightings over 53 days of in-water pile driving; some of the sightings were believed to be repeated sightings of the same individual (DOT&PF 2020, 2021a, 2021b, 2021c, 2021d). ADOT therefore predicts, and NMFS concurs, that one group of two individuals may occur within the Level B harassment zones twice per week during the proposed activities. As noted previously, ADOT estimates that pile driving would occur over the course of 91 days (13 weeks). Therefore, ADOT estimates, and NMFS concurs that 52 takes by Level B harassment of humpback whales (1 group of 2 individuals x 2 groups per week x 13 weeks = 52 takes by Level B harassment) from the Central North Pacific stock may occur in Tongass Narrows.

As noted above, ADOT estimates that simultaneous use of two hammers (any combination) could occur on up to 44 days during the project. On those days, the Level B harassment zone would extend into Clarence Strait. Local specialists estimated that approximately four humpback whales could pass through or near the portion of the Level B harassment zone in Clarence Strait each day. Therefore, ADOT estimates, and NMFS concurs, that during the 44 days with potential simultaneous use of two hammers, 176 takes by Level B harassment of humpback whale could occur in Clarence Strait (4 humpback whales x 44 days = 176 takes by Level B harassment). Therefore, the sum of total estimated takes by Level B harassment of humpback whale between Tongass Narrows and Clarence Strait is 228 (52 + 176 = 228 takes by Level B harassment), and NMFS proposes to authorize 228 takes by Level B harassment of humpback whale.

As noted previously, Wade *et al.* (2021) estimates that approximately 2 percent of all humpback whales in Southeast Alaska and northern British Columbia are of the Mexico DPS, while all others are of the Hawaii DPS. However, NMFS has conservatively assumed here that 6.1 percent of the total humpback population in Southeast Alaska is from the Mexico DPS (Wade *et al.* 2016). Therefore, of the 228 takes of humpback whale proposed for authorization, NMFS expects that a total of 14 takes would be of individuals from the Mexico DPS. NMFS expects that all other instances of proposed take would be from the non-listed Hawaii DPS.

Take by Level A harassment of humpback whales is neither anticipated nor proposed to be authorized because of the expected effectiveness of the required monitoring and mitigation measures (see **Proposed Mitigation** section below for more details). For all pile driving and DTH activities, the shutdown zone exceeds the calculated Level A harassment zone. Humpbacks are usually readily visible, and therefore, we expect PSOs to be able to effectively implement the required shutdown measures prior to any humpback whales incurring PTS within Level A harassment zones.

Minke Whales

Minke whales may be present in Tongass Narrows year-round. Their abundance throughout Southeast Alaska is very low, and anecdotal reports have not included minke whales near the project area. ADOT's monitoring program in Tongass Narrows also did not report any minke whale sightings. However, minke whales are distributed throughout a wide variety of habitats and could occur near the project area. Minke whales are generally sighted as solo individuals (Dahlheim *et al.* 2009).

As noted above, ADOT estimates that simultaneous use of two hammers (any combination) could occur on up to 44 days during the project. On those days, the Level B harassment zone would extend into Clarence Strait. Based on Freitag (2017; as cited in 83 FR 37473; August 1, 2018 and 83 FR 34134; July 17, 2019), ADOT estimates that three individual minke whales may occur near or within the Level B harassment zone (including both Tongass Narrows and Clarence Strait) every four months. Based on that estimated occurrence rate, NMFS estimates that three minke whales may occur in the Level B harassment zone during the proposed activities (occurring over approximately 3 months), and proposes to authorize 3 takes by Level B harassment of minke whales (Table 15).

The largest Level A harassment zone for minke whale extends 3,584 m from the noise source for 10 hours of DTH using a single hammer, and 3,084 m from the noise source for 4 hours of DTH using two hammers for 30-in piles simultaneously. (As noted previously, ADOT estimates that simultaneous use of any two hammer types would occur on no more than 44 days.) Zones for shorter durations and other activities would be smaller (Table 14). NMFS proposes to require a 1,500 m shutdown zone for minke whales during 24-in and 30-in DTH activities. Therefore, for some DTH activities, the estimated Level A harassment zone is larger than the proposed shutdown zone, and Level A harassment could occur.

To calculate take by Level A harassment, ADOT first calculated the ratio of the maximum Level A harassment isopleth for 30-in DTH using a single hammer minus the shutdown zone isopleth (3,584 m - 1,500 m = 2,084 m) to the Level B harassment zone isopleth (13,594 m; 2,084 m/13,594 m = 0.1533). ADOT multiplied the resulting ratio by the total potential take by Level B harassment, resulting in 1 take by Level A harassment (*i.e.*, 3 takes by Level B harassment x 0.1533 = 1 take by Level A harassment). NMFS reviewed and concurs with this method. (Potential operation of two DTH hammers for 24-in/30-in or 30-in/30-in pile combinations would result in larger Level A harassment isopleths than 4,269 m, however, such concurrent work would rarely occur, if at all, and therefore, as described above NMFS expects that calculating Level A harassment take using those zones is unnecessary.) Take by Level B harassment was calculated as the total potential minke whale takes by Level B harassment minus the takes by Level A harassment. ADOT therefore requests, and NMFS proposes to authorize 1 take by Level A harassment and 2 takes by Level B harassment (3 total takes of minke whale, Table 15).

Table 15-- Proposed Amount of Take as a Percentage of Stock Abundance, by Stock and Harassment Type

		Proposed Authorized Take			
Species	**DPS/Stock**	**Level A Harassment**	**Level B Harassment**	**Total**	**Percent of Stock**
Steller sea lion	Eastern U.S.	91	2,169	2,260	5.2
Harbor seal	Clarence Strait	116	1,014	1,130	4.1
Harbor porpoise	Southeast Alaska	5	27	32	2.5
Dall's porpoise	Alaska	20	207	227	1.7
Pacific white-sided dolphin	North Pacific	0	92	92	0.3
Killer whale	Alaska Resident	0	72	72	[a]3.1
	West Coast Transient				[a]20.1
	Northern Resident				[a]23.8
Humpback whale	Central North Pacific	0	228	228	[b]2.3
Minke whale	Alaska	1	2	3	N/A

Proposed Mitigation

In order to issue an IHA under section 101(a)(5)(D) of the MMPA, NMFS must set forth the permissible methods of taking pursuant to the activity, and other means of effecting the least practicable impact on the species or stock and its habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of the species or stock for taking for certain subsistence uses. NMFS regulations require applicants for incidental take authorizations to include information about the availability and feasibility (economic and technological) of equipment, methods, and manner of conducting the activity or other means of effecting the least practicable adverse impact upon the affected species or stocks and their habitat (50 CFR 216.104(a)(11)).

In evaluating how mitigation may or may not be appropriate to ensure the least practicable adverse impact on species or stocks and their habitat, as well as subsistence uses where applicable, we carefully consider two primary factors:

(1) The manner in which, and the degree to which, the successful implementation of the measure(s) is expected to reduce impacts to marine mammals, marine mammal species or stocks, and their habitat. This considers the nature of the potential adverse impact being mitigated (likelihood, scope, range). It further considers the likelihood that the measure will be effective if implemented (probability of accomplishing the mitigating result if implemented as planned), the likelihood of effective implementation (probability implemented as planned), and;

(2) The practicability of the measures for applicant implementation, which may consider such things as cost, impact on operations, and, in the case of a military readiness activity, personnel safety, practicality of implementation, and impact on the effectiveness of the military readiness activity.

Because of the need for an ESA Section 7 consultation for effects of the project on ESA listed humpback whales, there are a number of mitigation measures that go beyond, or are in addition to, typical mitigation measures we would otherwise require for this sort of project. The proposed measures are however typical for actions in the Ketchikan area. The mitigation measures included herein include measures that align with the 2019 Biological Opinion, and are subject to change, as required by NMFS' ESA Section 7 consultation. If Section 7 consultation warrants changes to these measures, NMFS expects that the new measures would align closely with those included in the recent proposed IHA for construction at the NOAA Port Facility Project in Ketchikan, Alaska (86 FR 68223; December 1, 2021). ADOT must employ the following mitigation measures as included in the proposed IHA:

- Avoid direct physical interaction with marine mammals during construction activity. If a marine mammal comes within 10 m of such activity, operations must cease and vessels must reduce speed to the minimum level required to maintain steerage and safe working conditions (note that NMFS expects that a 10 m shutdown zone is sufficient to avoid direct physical interaction with marine mammals, but ADOT has conservatively proposed a 20 m shutdown zone to avoid physical interaction for in-water other than vessel transit);
- Ensure that construction supervisors and crews, the monitoring team and relevant ADOT staff are trained prior to the start of all pile driving and DTH activity, so that responsibilities, communication procedures, monitoring protocols, and operational procedures are clearly understood. New personnel joining during the project must be trained prior to commencing work;
- Pile driving activity must be halted upon observation of either a species for which incidental take is not authorized or a species for which incidental take has been

authorized but the authorized number of takes has been met, entering or within the harassment zone;

- For any marine mammal species for which take by Level B harassment has not been requested or authorized, in-water pile installation/removal and DTH will shut down immediately when the animals are sighted;

- Employ PSOs and establish monitoring locations as described in the Marine Mammal Monitoring Plan and Section 5 of the IHA. The Holder must monitor the project area to the maximum extent possible based on the required number of PSOs, required monitoring locations, and environmental conditions. For all pile driving and removal at least three PSOs must be used;

- The placement of the PSOs during all pile driving and removal and DTH activities will ensure that the entire shutdown zone is visible during pile installation;

- Monitoring must take place from 30 minutes prior to initiation of pile driving or DTH activity (*i.e.*, pre-clearance monitoring) through 30 minutes post-completion of pile driving or DTH activity;

- If in-water work ceases for more than 30 minutes, ADOT will conduct pre-clearance monitoring of both the Level B harassment zone and shutdown zone;

- Pre-start clearance monitoring must be conducted during periods of visibility sufficient for the lead PSO to determine that the shutdown zones indicated in Table 16 are clear of marine mammals. Pile driving may commence following 30 minutes of observation when the determination is made that the shutdown zones are clear of marine mammals;

- If a marine mammal is observed entering or within the shutdown zones indicated in Table 16, pile driving must be delayed or halted. If pile driving is delayed or halted due to the presence of a marine mammal, the activity may not commence or resume until either the animal has voluntarily exited and been visually confirmed beyond the shutdown zone (Table 16) or 15 minutes have passed without re-detection of the animal (30 minutes for humpback whales);

- As required by the 2019 Biological Opinion, if waters exceed a sea state that restricts the PSOs' ability to make observations within the shutdown zone, in-water pile installation and removal will cease. Pile installation and removal will not be initiated or continue until the appropriate shutdown zone is visible in its entirety;
- For humpback whales, if the boundaries of the harassment zone have not been monitored continuously during a work stoppage, the entire harassment zone will be surveyed again to ensure that no humpback whales have entered the harassment zone that were not previously accounted for;
- In-water activities will take place only: between civil dawn and civil dusk when PSOs can effectively monitor for the presence of marine mammals; during conditions with a Beaufort Sea State of 4 or less; when the entire shutdown zone and adjacent waters are visible (*e.g.*, monitoring effectiveness is not reduced due to rain, fog, snow, etc.). Pile driving may continue for up to 30 minutes after sunset during evening civil twilight, as necessary to secure a pile for safety prior to demobilization for the evening. PSO(s) will continue to observe shutdown and monitoring zones during this time. The length of the post- activity monitoring period may be reduced if darkness precludes visibility of the shutdown and monitoring zones;
- Vessel operators will implement the following required measures: maintain a watch for marine mammals at all times while underway; remain at least and at least 91 m (100 yards (yd)) from all other listed marine mammals, travel at less than 5 knots (9 km/hr) when within 274 m (300 yd) of a whale; avoid changes in direction and speed when within 274 m (300 yd) of whales, unless doing so is necessary for maritime safety; not position vessel(s) in the path of whales, and will not cut in front of whales in a way or at a distance that causes the whales to change their direction of travel or behavior

(including breathing/surfacing pattern); check the waters immediately adjacent to the vessel(s) to ensure that no whales will be injured when the propellers are engaged; adhere to the Alaska Humpback Whale Approach Regulations when transiting to and from the project site (see 50 CFR 216.18, 223.214, and 224.103(b)); not allow lines to remain in the water, and not throw trash or other debris overboard, thereby reducing the potential for marine mammal entanglement; follow established transit routes and travel <10 knots while in the harassment zones; follow the speed limit within Tongass Narrows (7 knots for vessels over 23 ft in length). If a whale's course and speed are such that it will likely cross in front of a vessel that is underway, or approach within 91 m (100 yards (yd)) of the vessel, and if maritime conditions safely allow, the engine will be put in neutral and the whale will be allowed to pass beyond the vessel, except that vessels will remain 460 m (500 yd) from North Pacific right whales; if a humpback whale comes within 10 m (32.8 ft) of a vessel during construction, the vessel will reduce speed to the minimum level required to maintain safe steerage and working conditions until the humpback whale is at least 10 m (32.8 ft) away from the vessel; vessels are prohibited from disrupting the normal behavior or prior activity of a whale by any other act or omission.

- ADOT must use soft start techniques when impact pile driving. Soft start requires contractors to provide an initial set of three strikes at reduced energy, followed by a 30-second waiting period, then two subsequent reduced-energy strike sets. A soft start must be implemented at the start of each day's impact pile driving and at any time following cessation of impact pile driving for a period of 30 minutes or longer; and

- If take by Level B harassment reaches the authorized limit for an authorized species, pile installation will be stopped as these species approach the Level B harassment zone to avoid additional take of them.

Further, on days when simultaneous use of two hammers producing continuous noise (two DTH hammers, one DTH and one vibratory hammer, or two vibratory hammers) is expected:

- When combinations of one DTH hammer with a vibratory hammer or two DTH hammers are used simultaneously, each PSO of the two contractors will have three PSOs working and the PSO teams will work together to monitor the entire area;
- One or more PSOs will be present at each construction site during in-water pile installation and removal so that Level A harassment zones and shutdown zones are monitored by a dedicated PSO at all times.
- The ADOT environmental coordinator for the project will implement coordination between or among the PSO contractors. ADOT will include in the contracts that PSOs must coordinate, collaborate, and otherwise work together to ensure compliance with project permits and authorizations.

The following specific mitigation measures will also apply to ADOT's in-water construction activities:

Establishment of Level A Harassment Zones and Shutdown Zones —For all pile driving/removal and DTH activities, ADOT will establish a shutdown zone (Table 16). The purpose of a shutdown zone is generally to define an area within which shutdown of activity would occur upon sighting of a marine mammal (or in anticipation of an animal entering the defined area). Shutdown zones vary based on the activity type and duration and marine mammal hearing group (Table 16). For vibratory installation and removal and impact installation, shutdown zones will be based on the Level A harassment isopleth distances for each hearing group.

ADOT anticipates that the daily duration of DTH use may vary significantly, with large differences in maximum zones sizes possible depending on the work planned for a given day. Given this uncertainty and concerns related to ESA-listed humpback whales, ADOT would utilize a tiered system to identify and monitor the appropriate Level A harassment zones and shutdown zones, based on the maximum expected DTH duration. At the start of any work involving DTH, ADOT would first determine whether DTH may occur at two sites concurrently or just at one site. If DTH may occur at two sites concurrently, then ADOT would implement the Level A harassment zones and shutdown zones associated with simultaneous DTH use of the relevant pile sizes (Table 14 and Table 16). If DTH may only occur at one site, ADOT would then determine the maximum duration of DTH possible that day (according to the defined duration intervals in Table 16), which would determine the appropriate Level A harassment isopleth for that day (Table 13 and Table 14). This Level A harassment zone and associated shutdown zone must be observed by PSO(s) for the entire work day or until it is determined that, given the duration of activity for the day, the Level A harassment isopleth cannot exceed the next lower Level A harassment isopleth size in Table 13.

Due to practicability concerns, shutdown zones for some species during some activities may be smaller than the Level A harassment isopleths (Table 16). The placement of PSOs during all pile driving, pile removal, and DTH activities (described in detail in the **Proposed Monitoring and Reporting** Section) will ensure that the entire shutdown zones are visible during pile installation.

Table 16-- Shutdown Zones and Level B Harassment Isopleths for Each Activity

Activity	Pile Size (in)	Minutes per Pile or Strikes per Pile	Shutdown Distances (m)						Level B Harassment Isopleth (m)
			LF (humpback whales)	LF (minke whales)	MF	HF	PW	OW	
Vibratory Installation	30	60 min	50	20					6,310
	24	60 min							5,412
	20	60 min							

Vibratory Removal	24	60 min							
DTH of Rock Sockets	30	60 min	780	1,500	30	500	200	40	13,594
		120 min	1,300		50			50	
		180 min	1,700		60			70	
		240 min	2,000		70			80	
		300 min	2,300		90			90	
		360 min	2,600		100			100	
		420 min	2,900						
		480 min	3,100						
		540 min	3,400						
		600 min	3,600		130			100	
	24	60 min	360	1,500	20	500	200	20	
		120 min	570		30			30	
		180 min	750		30			30	
		240 min	910		40			40	
		300 min	1,100		40			50	
		360 min	1,200		50			50	
		420 min	1,400		50			60	
		480 min	1,500		60			60	
		540 min	1,600		60			70	
		600 min	1,700		60			70	
DTH of Tension Anchor	8	120 min	90	90	20	100	50	20	
		240 min	130	130		160	70		
Impact Installation	30	50 strikes	100	100	20	120	60	20	2,154
	24	50 strikes	60	60		70	30		1,000
	20	50 strikes							

Table 17-- Shutdown Zones, by Hearing Group for Simultaneous Use of Two DTH Hammers

Activity Combination	Level A Harassment Isopleth (m)				
	LF	MF	HF	PW	OW
8-in pile, 8-in pile	210	20	250	110	20
8-in pile, 24-in pile	1,300	50	500	200	60
8-in pile, 30-in pile	2,800	100			110
24-in pile, 24-in pile	1,440	60			60
24-in pile, 30-in	2,270	90			90
30-in pile, 30-in pile	3,090	110			120

ADOT also must abide by the terms and conditions of the December 19, 2019 Biological Opinion and Incidental Take Statement issued by NMFS pursuant to section 7 of the Endangered Species Act.

Based on our evaluation of the applicant's proposed measures, as well as other measures considered by NMFS, NMFS has preliminarily determined that the proposed mitigation measures provide the means effecting the least practicable impact on the affected species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance.

Proposed Monitoring and Reporting

In order to issue an IHA for an activity, section 101(a)(5)(D) of the MMPA states that NMFS must set forth requirements pertaining to the monitoring and reporting of such taking. The MMPA implementing regulations at 50 CFR 216.104 (a)(13) indicate that requests for authorizations must include the suggested means of accomplishing the necessary monitoring and reporting that will result in increased knowledge of the species and of the level of taking or impacts on populations of marine mammals that are expected to be present in the proposed action area. Effective reporting is critical both to compliance as well as ensuring that the most value is obtained from the required monitoring.

Monitoring and reporting requirements prescribed by NMFS should contribute to improved understanding of one or more of the following:

- Occurrence of marine mammal species or stocks in the area in which take is anticipated (*e.g.*, presence, abundance, distribution, density).

- Nature, scope, or context of likely marine mammal exposure to potential stressors/impacts (individual or cumulative, acute or chronic), through better understanding of: (1) action or environment (*e.g.*, source characterization, propagation, ambient noise); (2) affected species (*e.g.*, life history, dive patterns); (3) co-occurrence of marine mammal species with the action; or (4) biological or behavioral context of exposure (*e.g.*, age, calving or feeding areas).

- Individual marine mammal responses (behavioral or physiological) to acoustic stressors (acute, chronic, or cumulative), other stressors, or cumulative impacts from multiple stressors.

- How anticipated responses to stressors impact either: (1) long-term fitness and survival of individual marine mammals; or (2) populations, species, or stocks.

- Effects on marine mammal habitat (*e.g.*, marine mammal prey species, acoustic habitat, or other important physical components of marine mammal habitat).

- Mitigation and monitoring effectiveness.

Visual Monitoring

Monitoring must be conducted by qualified, NMFS-approved PSOs, in accordance with the following:

- PSOs must be independent (*i.e.*, not construction personnel) and have no other assigned tasks during monitoring periods. At least one PSO must have prior experience performing the duties of a PSO during construction activity pursuant to a NMFS-issued IHA. Other PSOs may substitute other relevant experience, education (degree in biological science or related field), or training for prior experience performing the duties of a PSO during construction activity pursuant to a NMFS-issued IHA. Where a team of three or more PSOs is required, a lead observer or monitoring coordinator must be designated. The lead observer must have prior experience performing the duties of a PSO during construction activity pursuant to a NMFS-issued incidental take authorization. PSOs must be approved by NMFS prior to beginning any activity subject to this IHA; and

- PSOs must record all observations of marine mammals as described in the Section 5 of the IHA and the Marine Mammal Monitoring Plan, regardless of distance from the pile being driven. PSOs shall document any behavioral reactions in concert with distance from piles being driven or removed;

PSOs must have the following additional qualifications:

- Ability to conduct field observations and collect data according to assigned protocols;

- Experience or training in the field identification of marine mammals, including the identification of behaviors;

- Sufficient training, orientation, or experience with the construction operation to provide for personal safety during observations;

- Writing skills sufficient to prepare a report of observations including but not limited to the number and species of marine mammals observed; dates and times when in-water construction activities were conducted; dates, times, and reason for implementation of mitigation (or why mitigation was not implemented when required); and marine mammal behavior; and

- Ability to communicate orally, by radio or in person, with project personnel to provide real-time information on marine mammals observed in the area as necessary;

Additionally, as required by NMFS' December 2019 Biological Opinion, each PSO will be trained and provided with reference materials to ensure standardized and accurate observations and data collection.

ADOT must employ three PSOs during all pile driving and DTH. A minimum of one PSO (the lead PSO) must be assigned to the active pile driving or DTH location to monitor the shutdown zones and as much of the Level B harassment zones as possible. Two additional PSOs are also required, though the observation points may vary depending on the construction activity and location of the piles. To select the best observation locations, prior to start of construction, the lead PSO will stand at the construction site to monitor the Level A harassment zones while two or more PSOs travel in opposite directions from the project site along Tongass Narrows until they have reached the edge of the appropriate Level B harassment zone, where they will identify suitable observation points from which to observe. When needed, an additional PSO will be stationed on the north end of Revilla Island observing to the northwest. See Figure 2-11 of ADOT's Marine Mammal Monitoring and Mitigation Plan for a map of proposed PSO locations. If visibility deteriorates so that the entire width of Tongass Narrows at the harassment zone boundary is not visible, additional PSOs may be positioned so that the entire width is visible, or work will be halted until the entire width is visible to ensure that any humpback whales entering or within the harassment zone are detected by PSOs.

When DTH use occurs, or simultaneous use of one DTH with a vibratory hammer or two DTH systems occurs, creating Level B harassment zones that exceed 13 km and 21 km, respectively, and Level A harassment zones that extend over 6 km, one additional PSO will be stationed at the northernmost land-based location at the entrance to Tongass Narrows (at least two PSOs total at that location, four PSOs on duty across all PSO locations). One of these PSO will focus on Tongass Narrows, specifically watching for marine mammals that could approach or enter Tongass Narrows and the project area. The second PSO will look out into Clarence Strait, watching for marine mammals that could swim through the ensonified area. No additional PSOs will be required at the southern-most monitoring location because the Level B harassment zones are truncated to the southeast by islands, which prevent propagation of sound in that direction beyond the confines of Tongass Narrows. Takes by Level B harassment will be recorded by PSOs and extrapolated based upon the number of observed takes and the percentage of the Level B harassment zone that was not visible.

Each construction contractor managing an active construction site and on-going in-water pile installation or removal will provide qualified, independent PSOs for their specific contract. The ADOT environmental coordinator for the project will implement coordination between or among the PSO contractors. It will be a required component of their contracts that PSOs coordinate, collaborate, and otherwise work together to ensure compliance with project permits and authorizations.

Reporting

A draft marine mammal monitoring report would be submitted to NMFS within 90 days after the completion of pile driving and removal activities, or 60 days prior to a requested date of issuance of any future IHAs for projects at the same location, whichever comes first. The report would include an overall description of work completed, a narrative regarding marine mammal sightings, and associated PSO data sheets. Specifically, the report must include:

- Dates and times (begin and end) of all marine mammal monitoring;
- Construction activities occurring during each daily observation period, including the number and type of piles driven or removed and by what method (*i.e.*, impact, vibratory or DTH) and the total equipment duration for vibratory removal or DTH for each pile or hole or total number of strikes for each pile (impact driving);
- PSO locations during marine mammal monitoring;
- Environmental conditions during monitoring periods (at beginning and end of PSO shift and whenever conditions change significantly), including Beaufort sea state and any other relevant weather conditions including cloud cover, fog, sun glare, and overall visibility to the horizon, and estimated observable distance;
- Upon observation of a marine mammal, the following information: Name of PSO who sighted the animal(s) and PSO location and activity at time of sighting; Time of sighting; Identification of the animal(s) (*e.g.*, genus/species, lowest possible taxonomic level, or unidentified), PSO confidence in identification, and the composition of the group if there is a mix of species; Distance and bearing of each marine mammal observed

relative to the pile being driven for each sighting (if pile driving was occurring at time of sighting); Estimated number of animals (min/max/best estimate); Estimated number of animals by cohort (adults, juveniles, neonates, group composition, sex class, etc.); Animal's closest point of approach and estimated time spent within the harassment zone; Description of any marine mammal behavioral observations (*e.g.*, observed behaviors such as feeding or traveling), including an assessment of behavioral responses thought to have resulted from the activity (*e.g.*, no response or changes in behavioral state such as ceasing feeding, changing direction, flushing, or breaching);

- Number of marine mammals detected within the harassment zones and shutdown zones, by species;
- Table summarizing any incidents resulting in take of ESA-listed species;
- Detailed information about any implementation of any mitigation triggered (*e.g.*, shutdowns and delays), a description of specific actions that ensued, and resulting changes in behavior of the animal(s), if any;
- Description of other human activity within each monitoring period;
- Description of any deviation from initial proposal in pile numbers, pile types, average driving times, etc.;
- Brief description of any impediments to obtaining reliable observations during construction period;
- Description of any impediments to complying with these mitigation measures; and
- If visibility degrades to where the PSO(s) cannot view the entire impact or vibratory harassment zones, take of humpback whales would be extrapolated based on the estimated percentage of the monitoring zone that remains visible and the number of marine mammals observed.

If no comments are received from NMFS within 30 days, the draft final report would constitute the final report. If comments are received, a final report addressing NMFS comments must be submitted within 30 days after receipt of comments.

Reporting Injured or Dead Marine Mammals

In the event that personnel involved in the construction activities discover an injured or dead marine mammal, the IHA-holder must immediately cease the specified activities and report the incident to the Office of Protected Resources (OPR) (*PR.ITP.MonitoringReports@noaa.gov*), NMFS and to the Alaska Regional Stranding Coordinator as soon as feasible. If the death or injury was clearly caused by the specified activity, ADOT must immediately cease the specified activities until NMFS is able to review the circumstances of the incident and determine what, if any, additional measures are appropriate to ensure compliance with the terms of the IHA. The IHA-holder must not resume their activities until notified by NMFS. The report must include the following information:

- Time, date, and location (latitude/longitude) of the first discovery (and updated location information if known and applicable);
- Species identification (if known) or description of the animal(s) involved;
- Condition of the animal(s) (including carcass condition if the animal is dead);
- Observed behaviors of the animal(s), if alive;
- If available, photographs or video footage of the animal(s); and
- General circumstances under which the animal was discovered.

Negligible Impact Analysis and Determination

NMFS has defined negligible impact as an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival (50 CFR 216.103). A negligible impact finding is based on the lack of likely adverse effects on annual rates of recruitment or survival (*i.e.*, population-level effects). An estimate of the number of takes alone is not enough information on which to base an impact determination. In addition to considering estimates of the number of marine mammals that might be "taken" through harassment, NMFS considers other factors, such as the likely nature of any responses (*e.g.*, intensity, duration), the context of any responses (*e.g.*, critical reproductive time or location, migration), as well as effects on habitat, and the likely effectiveness of the mitigation. We also assess the number, intensity, and context of estimated takes by evaluating this information relative to population status. Consistent with the 1989 preamble for NMFS's implementing regulations (54 FR 40338; September 29, 1989), the impacts from other past and ongoing anthropogenic activities are incorporated into this analysis via their impacts on the environmental baseline (*e.g.*, as reflected in the regulatory status of the species, population size and growth rate where known, ongoing sources of human-caused mortality, or ambient noise levels).

To avoid repetition, our analysis applies to all species listed in Table 2 for which take could occur, given that NMFS expects the anticipated effects of the proposed pile driving/removal and DTH on different marine mammal stocks to be similar in nature. Where there are meaningful differences between species or stocks, or groups of species, in anticipated individual responses to activities, impact of expected take on the population due to differences in population status, or impacts on habitat, NMFS has identified species-specific factors to inform the analysis.

Pile driving and DTH activities associated with the project, as outlined previously, have the potential to disturb or displace marine mammals. Specifically, the specified activities may result in take, in the form of Level B harassment and, for some species, Level A harassment from underwater sounds generated by pile driving. Potential takes could occur if marine mammals are present in zones ensonified above the thresholds for Level B harassment or Level A harassment, identified above, while activities are underway.

NMFS does not anticipate that serious injury or mortality would occur as a result of ADOT's planned activity given the nature of the activity, even in the absence of required mitigation. Further, no take by Level A harassment is anticipated for Pacific white-sided dolphin, killer whale, or humpback whale, due to the likelihood of occurrence and/or required mitigation measures. As stated in the mitigation section, ADOT would implement shutdown zones that equal or exceed many of the Level A harassment isopleths shown in Table 13. Take by Level A harassment is authorized for some species (Steller sea lions, harbor seals, harbor porpoises, Dall's porpoises, and minke whales) to account for the potential that an animal could enter and remain within the area between a Level A harassment zone and the shutdown zone for a duration long enough to be taken by Level A harassment, and in some cases, to account for the possibility that an animal could enter a shutdown zone without detection given the various obstructions along the shoreline, and remain in the Level A harassment zone for a duration long enough to be taken by Level A harassment before being observed and a shutdown occurring. Any take by Level A harassment is expected to arise from, at most, a small degree of PTS because animals would need to be exposed to higher levels and/or longer duration than are expected to occur here in order to incur any more than a small degree of PTS. Additionally, and as noted previously, some subset of the individuals that are behaviorally harassed could also simultaneously incur some small degree of TTS for a short duration of time. Because of the small degree anticipated, though, any PTS or TTS potentially incurred here would not be expected to adversely impact individual fitness, let alone annual rates of recruitment or survival.

For all species and stocks, take would occur within a limited, confined area (adjacent to the project site) of the stock's range. Take by Level A harassment and Level

B harassment would be reduced to the level of least practicable adverse impact through use of mitigation measures described herein. Further the amount of take proposed to be authorized is small when compared to stock abundance.

Behavioral responses of marine mammals to pile driving, pile removal, and DTH at the sites in Tongass Narrows are expected to be mild, short term, and temporary. Marine mammals within the Level B harassment zones may not show any visual cues they are disturbed by activities or they could become alert, avoid the area, leave the area, or display other mild responses that are not observable such as changes in vocalization patterns. Given that pile driving, pile removal, and DTH would occur for only a portion of the project's duration and often on nonconsecutive days, any harassment occurring would be temporary. Additionally, many of the species present in Tongass Narrows or Clarence Strait would only be present temporarily based on seasonal patterns or during transit between other habitats. These temporarily present species would be exposed to even smaller periods of noise-generating activity, further decreasing the impacts.

For all species except humpback whales, there are no known Biologically Important Areas (BIAs) near the project zone that would be impacted by ADOT's planned activities. For humpback whales, the whole of Southeast Alaska is a seasonal BIA from spring through late fall (Ferguson *et al.* 2015), however, Tongass Narrows and Clarence Strait are not important portions of this habitat due to development and human presence. Tongass Narrows is also a small passageway and represents a very small portion of the total available habitat. Also, while southeast Alaska is considered an important area for feeding humpback whales between March and May (Ellison *et al.* 2012), it is not currently designated as critical habitat for humpback whales (86 FR 21082; April 21, 2021).

More generally, there are no known calving or rookery grounds within the project area, but anecdotal evidence from local experts shows that marine mammals are more prevalent in Tongass Narrows and Clarence Strait during spring and summer associated with feeding on aggregations of fish, meaning the area may play a role in foraging. Because ADOT's activities could occur during any season, takes may occur during important feeding times. However, the project area represents a small portion of available foraging habitat and impacts on marine mammal feeding for all species, including humpback whales, should be minimal.

Any impacts on marine mammal prey that would occur during ADOT's planned activity would have, at most, short-term effects on foraging of individual marine mammals, and likely no effect on the populations of marine mammals as a whole. Indirect effects on marine mammal prey during the construction are expected to be minor, and these effects are unlikely to cause substantial effects on marine mammals at the individual level, with no expected effect on annual rates of recruitment or survival.

In addition, it is unlikely that minor noise effects in a small, localized area of habitat would have any effect on the stocks' annual rates of recruitment or survival. In combination, we believe that these factors, as well as the available body of evidence from other similar activities, demonstrate that the potential effects of the specified activities would have only minor, short-term effects on individuals. The specified activities are not expected to impact rates of recruitment or survival and would, therefore, not result in population-level impacts.

In summary and as described above, the following factors primarily support our preliminary determination that the impacts resulting from this activity are not expected to adversely affect the species or stock through effects on annual rates of recruitment or survival:

- No serious injury or mortality is anticipated or proposed for authorization;
- Take by Level A harassment of Pacific white-sided dolphin, killer whale, and humpback whale is not anticipated or proposed for authorization;

- ADOT would implement mitigation measures including soft-starts for impact pile driving and shutdown zones to minimize the numbers of marine mammals exposed to injurious levels of sound, and to ensure that take by Level A harassment is, at most, a small degree of PTS;
- The intensity of anticipated takes by Level B harassment is relatively low for all stocks and would not be of a duration or intensity expected to result in impacts on reproduction or survival;
- The only known area of specific biological importance covers a broad area of southeast Alaska for humpback whales, and the project area is a very small portion of that BIA. No other known areas of particular biological importance to any of the affected species or stocks are impacted by the activity, including ESA-designated critical habitat;
- The project area represents a very small portion of the available foraging area for all potentially impacted marine mammal species and stocks and anticipated habitat impacts are minor; and
- Monitoring reports from similar work in Tongass Narrows have documented little to no effect on individuals of the same species impacted by the specified activities.

Based on the analysis contained herein of the likely effects of the specified activity on marine mammals and their habitat, and taking into consideration the implementation of the proposed monitoring and mitigation measures, NMFS preliminarily finds that the total marine mammal take from the proposed activity will have a negligible impact on all affected marine mammal species or stocks.

Small Numbers

As noted above, only small numbers of incidental take may be authorized under sections 101(a)(5)(A) and (D) of the MMPA for specified activities other than military readiness activities. The MMPA does not define small numbers and so, in practice, where estimated numbers are available, NMFS compares the number of individuals taken to the most appropriate estimation of abundance of the relevant species or stock in our determination of whether an authorization is limited to small numbers of marine mammals. When the predicted number of individuals to be taken is fewer than one third of the species or stock abundance, the take is considered to be of small numbers. Additionally, other qualitative factors may be considered in the analysis, such as the temporal or spatial scale of the activities.

The instances of take NMFS proposes to authorize is below one third of the estimated stock abundance for all stocks (see Table 15). The number of animals that we expect to authorize to be taken from these stocks would be considered small relative to the relevant stocks' abundances even if each estimated taking occurred to a new individual, which is an unlikely scenario. Some individuals may return multiple times in a day, but PSOs would count them as separate takes if they cannot be individually identified.

The Alaska stock of Dall's porpoise has no official NMFS abundance estimate for this area, as the most recent estimate is greater than eight years old. The most recent estimate was 13,110 animals for just a portion of the stock's range. Therefore, the 227 takes of this stock proposed for authorization clearly represent small numbers of this stock.

Likewise, the Southeast Alaska stock of harbor porpoise has no official NMFS abundance estimate as the most recent estimate is greater than eight years old. The most recent estimate was 11,146 animals (Muto *et al.* 2021) and it is highly unlikely this number has drastically declined. Therefore, the 32 takes of this stock proposed for authorization clearly represent small numbers of this stock.

There is no current or historical estimate of the Alaska minke whale stock, but there are known to be over 1,000 minke whales in the Gulf of Alaska (Muto *et al.* 2018) so the 3 takes proposed for authorization clearly represent small numbers of this stock. Additionally, the range of the Alaska stock of minke whales is extensive, stretching from the Canadian Pacific coast to the Chukchi Sea, and ADOT's project area impacts a small portion of this range. Therefore, the 3 takes of minke whale proposed for authorization is small relative to estimated survey abundance, even if each proposed take occurred to a new individual.

Based on the analysis contained herein of the proposed activity (including the proposed mitigation and monitoring measures) and the anticipated take of marine mammals, NMFS preliminarily finds that small numbers of marine mammals will be taken relative to the population size of the affected species or stocks.

Unmitigable Adverse Impact Analysis and Determination

In order to issue an IHA, NMFS must find that the specified activity will not have an "unmitigable adverse impact" on the subsistence uses of the affected marine mammal species or stocks by Alaska Natives. NMFS has defined "unmitigable adverse impact" in 50 CFR 216.103 as an impact resulting from the specified activity: (1) That is likely to reduce the availability of the species to a level insufficient for a harvest to meet subsistence needs by: (i) Causing the marine mammals to abandon or avoid hunting areas; (ii) Directly displacing subsistence users; or (iii) Placing physical barriers between the marine mammals and the subsistence hunters; and (2) That cannot be sufficiently mitigated by other measures to increase the availability of marine mammals to allow subsistence needs to be met.

Harbor seals are the marine mammal species most regularly harvested for subsistence by households in Ketchikan and Saxman (a community a few miles south of Ketchikan, on the Tongass Narrows). Eighty harbor seals were harvested by Ketchikan residents in 2007, which ranked fourth among all communities in Alaska that year for harvest of harbor seals. Thirteen harbor seals were harvested by Saxman residents in

2007. In 2008, two Steller sea lions were harvested by Ketchikan-based subsistence hunters, but this is the only record of sea lion harvest by residents of either Ketchikan or Saxman. In 2012, the community of Ketchikan had an estimated subsistence take of 22 harbor seals and 0 Steller sea lion (Wolf *et al.* 2013). NMFS is not aware of more recent data. Hunting usually occurs in October and November (ADF&G 2009), but there are also records of relatively high harvest in May (Wolfe *et al.* 2013). The Alaska Department of Fish and Game (ADF&G) has not recorded harvest of cetaceans from Ketchikan or Saxman (ADF&G 2018).

All project activities would take place within the industrial area of Tongass Narrows immediately adjacent to Ketchikan where subsistence activities do not generally occur. Both the harbor seal and the Steller sea lion may be temporarily displaced from the project area. The project also would not have an adverse impact on the availability of marine mammals for subsistence use at locations farther away, where these construction activities are not expected to take place. Some minor, short-term harassment of the harbor seals could occur, but given the information above, we would not expect such harassment to have effects on subsistence hunting activities.

Based on the description of the specified activity and the proposed mitigation and monitoring measures, NMFS has preliminarily determined that there will not be an unmitigable adverse impact on subsistence uses from ADOT's proposed activities.

Endangered Species Act

Section 7(a)(2) of the Endangered Species Act of 1973 (ESA: 16 U.S.C. 1531 *et seq*.) requires that each Federal agency insure that any action it authorizes, funds, or carries out is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of designated critical habitat. To ensure ESA compliance for the issuance of IHAs, NMFS' Office of Protected Resources (OPR) consults internally whenever we propose to authorize take for endangered or threatened species, in this case with NMFS' Alaska Regional Office (AKRO).

NMFS OPR is proposing to authorize take of the Central North Pacific stock of humpback whales, of which a portion belong to the Mexico DPS of humpback whales, which are ESA-listed. On February 6, 2019, NMFS AKRO completed consultation with ADOT for Tongass Narrows Project and issued a Biological Opinion. Reinitiation of formal consultation was required to analyze changes to the action that were not considered in the February 2019 opinion (PCTS# AKR-2018-9806/ECO# AKRO-2018-01287). The original opinion considered the effects of only one project component being constructed at a time and did not analyze potential effects of concurrent pile driving which may cause effects to the listed species that were not considered in the original opinion; therefore, reinitiation of formal consultation was required. NMFS' AKRO issued a revised Biological Opinion to NMFS' OPR on December 19, 2019 which concluded that issuance of IHAs to ADOT is not likely to jeopardize the continued existence of Mexico DPS humpback whales. The effects of this proposed Federal action were adequately analyzed in NMFS' *Endangered Species Act (ESA) Section 7(a)(2) Biological Opinion for Construction of the Tongass Narrows Project (Gravina Access)*, revised December 19, 2019, which concluded that the take NMFS proposes to authorize through this IHA would not jeopardize the continued existence of any endangered or threatened species or destroy or adversely modify any designated critical habitat. Because the currently proposed take of Mexico DPS of humpback whales exceeds that authorized in the 2019 Biological Opinion, NMFS will need to reinitiate consultation on this project.

Proposed Authorization

As a result of these preliminary determinations, NMFS proposes to issue an IHA to ADOT for the construction of four facilities in the channel between Gravina Island and Revillagigedo (Revilla) Island in Ketchikan, Alaska: the Gravina Airport Ferry Layup

Facility, the Gravina Freight Facility, the Revilla New Ferry Berth, and the Gravina Island Shuttle Ferry Berth Facility in Tongass Narrows, Alaska beginning in March 2022, provided the previously mentioned mitigation, monitoring, and reporting requirements are incorporated. A draft of the proposed IHA can be found at *https://www.fisheries.noaa.gov/permit/incidental-take-authorizations-under-marine-mammal-protection-act*.

Request for Public Comments

We request comment on our analyses, the proposed authorization, and any other aspect of this notice of proposed IHA for the proposed construction activities. We also request at this time comment on the potential Renewal of this proposed IHA as described in the paragraph below. Please include with your comments any supporting data or literature citations to help inform decisions on the request for this IHA or a subsequent Renewal IHA.

On a case-by-case basis, NMFS may issue a one-time, one-year Renewal IHA following notice to the public providing an additional 15 days for public comments when (1) up to another year of identical or nearly identical activities as described in the **Description of Proposed Activities** section of this notice is planned or (2) the activities as described in the **Description of Proposed Activities** section of this notice would not be completed by the time the IHA expires and a Renewal would allow for completion of the activities beyond that described in the *Dates and Duration* section of this notice, provided all of the following conditions are met:

- A request for renewal is received no later than 60 days prior to the needed Renewal IHA effective date (recognizing that the Renewal IHA expiration date cannot extend beyond one year from expiration of the initial IHA).

- The request for renewal must include the following:

(1) An explanation that the activities to be conducted under the requested Renewal IHA are identical to the activities analyzed under the initial IHA, are a subset of the activities, or include changes so minor (*e.g.*, reduction in pile size) that the changes do not affect the previous analyses, mitigation and monitoring requirements, or take estimates (with the exception of reducing the type or amount of take).

(2) A preliminary monitoring report showing the results of the required monitoring to date and an explanation showing that the monitoring results do not indicate impacts of a scale or nature not previously analyzed or authorized.

Upon review of the request for Renewal, the status of the affected species or stocks, and any other pertinent information, NMFS determines that there are no more than minor changes in the activities, the mitigation and monitoring measures will remain the same and appropriate, and the findings in the initial IHA remain valid.

Dated: January 27, 2022.

Kimberly Damon-Randall,

Director, Office of Protected Resources,

National Marine Fisheries Service.

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